

# INDUSTRIAL-ARTS MAGAZINE

Incorporating: HANDICRAFT and the ARTS AND CRAFTS MAGAZINE

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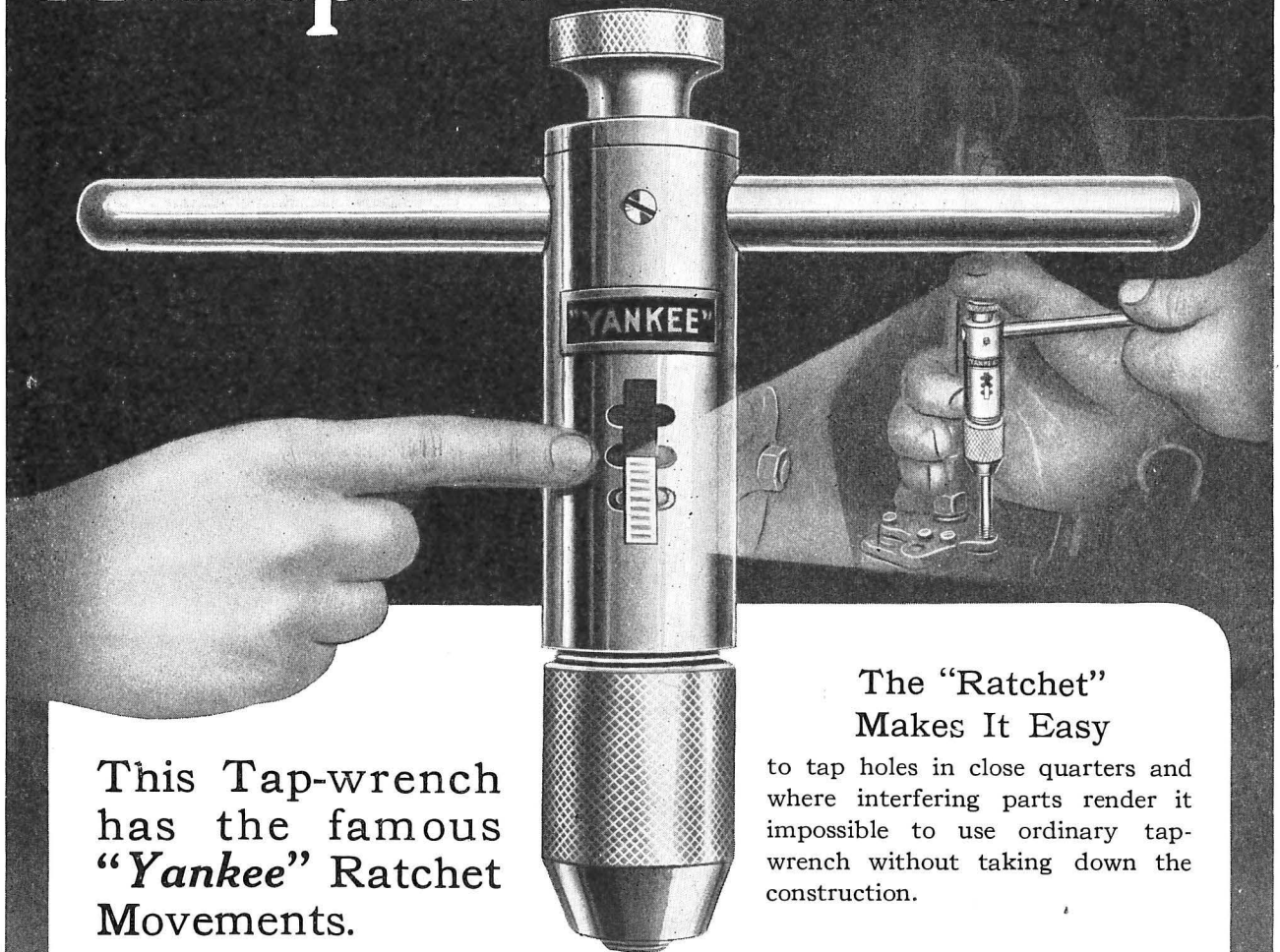
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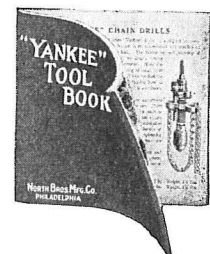
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## THE DEEPER MEANING OF ART

Dr. Arthur Holmes, Ph. D., Dean of the General Faculty, Pennsylvania State College



IT is customary to say the artist creates beauty. He does this in several ways. The most obvious one is the production of the painting itself. Whatever his product is in the minds of the critics or the ultraists it still remains in the minds undebauched by artistic culture, an attempt, at least, at the creation of something beautiful. A painted picture cannot be a mere copy of nature, for nature is too infinite in her detail, too varied in her aspects, too fickle in her moods, ever to be copied by a slow-moving brush. Hence, there must be a created element in the most faithful reproduction of the realist.

A less obvious phase of the process emphasizes the creation of feelings in the mind of the beholder. The painter stirs the esthetic feelings of his admirers. He puts beauty into their souls while they stand before his canvases, and the memories of his pictures stir their depths when they are gone. These emotions come only thru his pictures. Nature herself cannot arouse them. She has revealed her charms to her favorite, the artist-born, and he only has power to stir men's souls with the same emotions he experiences when gazing upon the face of his mistress.

Very closely allied to this process is the artist's next method of creating beauty. He not only creates beauty in the souls of his spectators but he externalizes it. He discovers to ungifted eyes unsuspected beauties in nature. His own eye searches out nooks and crannies of light and shade, tint and tone, and reveals beneath the trees a hitherto unperceived purple, or places in its setting a before unnoted harmony of composition. Thereafter, to those who look upon a painted masterpiece of some dear familiar place, old scenes are new scenes, commonplaces are shrines of mystic joys, arcs of sacred beauty-treasures. The artist's work has opened the eyes of the blind and henceforth they see. Before, all trees were green. Now a near tree is green, a far tree is blue, the tree-covered mountains are purple. So he creates a new world of beauty by revealing it.

Still there is a fourth and a deeper meaning to creation in art. The first three can be taken as only figurative expressions. Now we come into the presence of reality. The artist really *does create* a world. For example, a man looks at one of Dull's pictures of the common Delaware River. He sees in the painting myriad dashes of color all twined and intertwined with surpassing skill into a radiant combination of

wonders. His first impulse is to cry out against such a patent transfiguration of his familiar old river, gray and common in the mist as he has seen it a thousand times from a ferry-boat in the early morning or evening. Never were such colors on its surface! What is the use of painting such outlandish stuff? What does the artist mean anyhow? Pity the Delaware cannot like Cromwell cry out: "Paint me as I am!"

Then he looks closer and sees a little patch of subdued purple and admits that he saw that on the real river once, perhaps twice. Possibly, on second thought, he can also admit he did one time in the morning just when the sun was coming up, see that speck of red run out into the blue-gray of the cold water; yes, possibly he saw that, but for the rest it is too lurid to be true. It is melodrama on canvas, imagination run riot, color hyper-sensitized, nature tricked out in gay garments for the delectation of those who think art consists in disguising the real. To prove his criticisms the spectator resolves to confirm his judgments by taking a good look at the river the next time he uses the ferry.

Well, next time he does. He looks at the river. At first, it is the usual pallid and monotonous gray. Then a little dash of color creeps timorously in; the gray is a little blue-gray, but not a dead-level blue-gray, for there are masses of color splashed around haphazardly. Surely that is a warmer purple suffusing the cold blue. Where does it begin anyhow? Where does it end? See how it warms and spreads and changes. O, the sun has come up; no wonder. Still, as the man never did before watch a sunrise paint the water, he keeps on looking and seeing strange metamorphoses as weird as the change of the neutral tinted caterpillar into the wonder-colored butterfly. He is brought back to his senses by the bump of the ferry-boat into the slip and he hurries away to business to forget the river and art and all that go therewith.

But lunch-time gives him a chance to drop into the store where that picture is and he refreshes his memory of the painting by taking a good look at it once more. He dwells on its features, prints them on his mind, carries away the colors in his memory. The man admits the fact that there really was more color on the river this morning than he ever saw before, but the difference in the variegation and the intensity of pigments in the picture and on the river is still great, far too great, for anyone to believe that

the colorings really do lie in masses and patches as luxuriously flung about by the hand of nature as by the prodigal hand of the painter.

That evening he looks at the river again. He never saw it, really and truly saw it, by sunset before. Why, the thing is a mass of color, not vivid or striking at first; one's eyes must get used to it; one must search out the tints and tones; but they are there, in reality and in truth when one knows how and where to look.

Well, to make a long story short, the man keeps on looking. The more he looks the more he sees. The more he sees, the oftener he compares his discoveries with the picture. Gradually, he beholds a transformed river. Before he knows it, his experience extends to his whole world. The old ferry-boat itself becomes decorated with masses of color worth studying in themselves as it plows morning and night thru a sea of tinting so lavish, so abundant, so variegated, so rich in their static and dynamic beauties that the man looks forward to his daily trips as a child does to the evening fairy-tale. He tries to share what he sees with some of his fellow-passengers, office-men like himself. They look a minute and then turn back to their papers. When he presses them to see, see, see, they chaff him and tell him to go buy a kodak and get it out of his system. So, we will leave him immersed in his new-found world looking on nature like a man in love.

The question for the thinker is: are the colors really there? Of course, says the common-sense man. Not at all, says the scientist; for everybody who has studied the elements of psychology knows well that color is something made by man. To begin with, color lies not on the surface of an object but resides in the light. Then it is involved in the color-zones in the retina. A color-blind man cannot see some colors at all. Then it may be traced to the back of the brain in the cuneiform lobe. If that is destroyed color goes.

Even more mysterious, says the psychologist, some men are psychically blind. They cannot see color at all, tho their eyes, and their optic nerves and their brain centers are entirely intact. Color, as a matter of fact, resides wholly in a man's mind, in his consciousness. If he sees red, it is never an imaginary red. For him it is really and truly red. If he sees the red every time he looks at an object it is a real red no matter if nobody else on earth ever sees red in the same object. If a man is hypnotized and sees black snow, for him it is an indubitable and genuine black.

The fact is that is just what happened to our clerk friend. When Dull looked at the river he saw there colors no man ever saw before. They were no more really on the river or in the river than any color is on or in any object. All the colors he saw were really in the artist's soul. What he saw he painted; that is, he manipulated the paints and can-

vas so as to produce the same effect upon a spectator of his canvases as he received when he turned his eyes, loaded with spiritually prismatic sunlight, upon the river where he saw a fairy-land closed to the eyes of common men. Then a common man looked upon the canvas; disbelieved like doubting Thomas; went and looked for himself—as he thought—but looked in reality under the spell of the canvas and began to see things. Then he looked again and saw more, and still more, until under the hypnotic influence of the canvas and the painter's power he threw out from his own soul the colors on the canvases and floated them in ever changing forms as fancy suited him, upon the willing waves of the old Delaware.

This is the deeper meaning contained in the phrase: the artist creates beauty. He does it. That is the simple truth. He paints nature literally; as literally as if he froze the river over and painted upon its impassive bosom the tints of a thousand sunsets. But, perforce, he must do it in another way, a more indirect, round-about way. But because it is round-about, it is no less really true that he *does* create the color. If a rich uncle just before he dies hands over to his nephew a bag of gold for his inheritance it is no more real than if he does it thru a will and by a check on a bank. The artist cannot color the water, but he can color the canvas with colors that were never seen on land or sea, and then the canvas conveys the same set of colors in the minds of his spectators, and when they return themselves to look at the river, by the law of suggestion they must see the same colors on the water. This is the simple law of psychic suggestion expressed in all its simplicity and without intermeddling disturbances.

Why do not all people see it the same? Because of the intermeddling I just mentioned. They refuse to see it. They doubt. They never look. They do not surrender to the hypnotic process. They stick to their old ideas of reality, and nature and color, and to their old memories of the river as they have always seen it and consequently the spell fails and no new world is created out of the airy fancies of an artist's dream. But unto some people is given the facile imagination, the suggestive soul, the artistic spirit. They yield to the suggestion of beauty; they go forth to verify and lo, they find rich treasures of newly created beauty contained in the familiar objects of daily life. Henceforth, they walk in a new heaven and a new earth, one of their own creation, made by their own natural powers lying dormant until the born artist touched and aroused their slumbering faculties.

However beautiful this may sound it is more than poetry. That it is good psychology I know. It all might be stated in the strictest psychological nomenclature, punctuated with memory-images, pre-perceptions, auto-suggestions, psycho-physical parallelism, idealistic monism, and a host of other hard

words redolent of deep philosophies and embellished with an impressive array of authorities. I have stated just the simple truth about the matter. How far the truth may still lead the speculative mind I do not pretend to profess. It may lead into endless mazes that rise now before the eyes of modern

philosophers like distant banks in the fog, which may upon closer inspection either melt into fantastic shaped clouds or grow into the distinct outlines and solid proportions of new continents of reality. But this fact remains true: the artist *does paint nature*, does *create* beauty.

## Special Needs of Evening Technical Schools

W. H. Dooley, Director of Extension School for Ship Builders, Brooklyn, N. Y.



THE oldest type of schools in this country and England for the adult is the evening school. It has produced in the past and is producing at present some of our best business and industrial men and women.

It is a growing institution and is bound to increase its usefulness to meet the daily educational needs of thousands of working men and women. This type of education is recognized in our large industrial and commercial centers as coming to be as important as the education of the child.

Evening schools are of two types: First, those adapted to meet a demand of those deficient in early education who are desirous of making up this deficiency; second, those classes which supplement acquired skill with technical training that will lead to advancement and increased earning power.

There is no question but that the most ambitious workers in every industry covet the opportunity thru evening study of securing a higher grade of life equipment. The success of the existing public evening technical and textile schools bear witness to this fact. In fact the attendance at the evening sessions is about four and one-half times what it is during the day.

The extraordinary success of the correspondence school in large cities is another indication of an earnest desire of many workmen to improve themselves in their general vocations. Over 1,600 students are enrolled in one school from one city and its suburbs. The disadvantage of instruction by correspondence is very great, but such instruction is better than nothing. There are thousands of men intellectually incapable of benefiting by this course. Not more than three in one hundred complete their course. In fact the International Correspondence School admitted in a recent article in the "American Machinist" that but 2.6 per cent of their students have been awarded a certificate or diploma; the vast majority of men enrolling are soon discouraged and frequently lose faith in their work.

Evening schools in order to be most effective must be planned and organized on different lines than the day schools.

We should bear in mind that the average length of a boy's school life until recently was only about four years, and that was before he was 12 years of age. Then, again, we are not sure that he received this amount of education, as no systematic method

was adopted until recently to keep the boy at school. Consequently these boys who are now the industrial workers have received little, if any more, education than that obtained during these four years.

With the development of the industries, which has been very rapid, have appeared new demands for more men, each with larger ideas, greater capacity and more training. At one time the shop and mill were training schools for workers, but it is no longer so. The old apprenticeship system is dead, and under the specialized condition of modern industries a worker knows one part of the numerous industrial operations. He works day by day at the same kind of work and under precisely the same condition, the operation and the machine usually requiring little thought and ingenuity. The average worker knows nothing about the machine itself or the operations that precede and follow his own, and very little about the raw materials that are used. Under such routine work and circumstances the industrial worker loses the habit of thinking, since no demand is made upon him for thought. As a result of having had no systematic demand for his earlier education, by the time the worker enters manhood or is ready to be promoted to a higher position he is likely to forget what schooling he has had before the ages of 12 or 14, and is apt to be intellectually less efficient than when he left school.

The result is that when adults attend evening school they remember very little of the academic work they had received in earlier life. In addition they are tired after a hard day's work and have therefore an intensely practical aim in view; and are unwilling to study systematically an entire subject. They demand that the instruction shall lead directly to the specific things they want to know. If they are obliged to spend a month or more of preliminary work, the value of which they do not immediately discover, they will not attend.

Then again, mechanics and other industrial workers who may, perhaps, have some reputation in their trade, and who wish to perfect themselves in certain technical lines, do not wish to be grouped with younger persons, feeling that such persons having come recently from the public schools are able to answer questions, use English better and appear to better advantage than they do. In other words, adults are often sensitive about the comparisons



which the younger members of a class are apt to make at their expense.

Every worker attends an evening technical class to satisfy a definite need. To illustrate: A young machinist found difficulty in reading a working drawing with sufficient skill to do properly his daily work. He enrolled in the mechanical drawing course in our public evening school, thinking this course would meet his deficiency. He found that the first few lessons were concerned with lettering plates, the next three with drawing straight and curved lines and the handling of instruments, and that the remainder of the term was spent on the projection of points, lines, surfaces and solids. During all this time he was receiving in his daily work the same reprimands, and was therefore debating in his own mind the value of the drawing course. It is undoubtedly true that the drawing course this teacher outlined was a proper one for teaching mechanical drawing for those who are to be draftsmen, but the average apprentice machinist like this young man does not see the direct application of this instruction to his daily work. He enrolled in the drawing schools for a definite purpose. To be sure, it was a narrow one, but, nevertheless, it had economic value to him.

The average machinist's fingers are hardened from rough work, so that he cannot manipulate the fine drawing instruments. It is impossible for him to draw hairlike lines and circles within circles and have them tangent. Then again, it is not necessary. The training a machinist needs in mechanical drawing is not the same as that of the draftsman. This young man shows he needs a course in blue print reading and arithmetic for machinists.

The same applies to other courses. A number of loomfixers in a worsted mill applied for a course in loomfixing in a textile school. The instructor began his lesson in the simplest loom—a cotton loom—but the worsted loomfixers left the class in a body. They were not interested in cotton looms. Two classes should have been formed, one in cotton and another in worsted loomfixing. Hence, evening school instruction in technical classes must be divided into small unit courses so as to satisfy definite needs. This may be carried out by allowing one whole week for preliminary registration so that all may attend and talk over their needs with the teachers who are familiar with the educational needs of the different industries in the community. Then it is possible to know what unit courses to offer and the content of information to impart to the men.

The first lesson in an evening school should be the most interesting one of the course. The teacher should show the value of more knowledge on the subject and, by offering an incentive, in this way he can hold the attention of the class and win the confidence and in this way have all of them leave the class the first night knowing some additional information about his daily work.

Instructors in evening technical classes should be practical men and women or at least in touch with the trades so as to be familiar with the different trades and with their needs and to know the difficulties met in every day life. Considerable shop practice should be used in applying the principles underlying the trade. The actual blue print, shop problems and methods should be used in the course.

Subjects that do not find continual application in the trade should be given in the advanced rather than the elementary course.

The instruction in the various branches of mathematics should be adapted to meet the needs of the mill operative, the machinist and the steam engineer. The terms used in the schoolroom should be expressed in the language of the shop and mill. How to find the size pulley for a certain loom does not awaken the interest in the steam engineer as much as the problem involving the same operations dealing with a problem in the boiler room.

All technical students should be classified into vocational classes according to their trades. For example, a class in arithmetic for engineers and a separate class in the same class for boiler firemen. Again, the textile designers have a class in arithmetic called loom calculation. This idea carries out the plan of the old workingman's guild. Each guild was formed for the purpose of social intercourse and mental stimulus. Each trade had its own guild. The daily trade experiences of each member became the property of all members. Discussion relating to the practices of their chosen trade occupied their attention. So today workingmen have common trade interests. Evening students should be grouped according to their occupations, and in this way have an opportunity to talk over these interests. The teacher should act as a leader and draw out the students in telling their trade experiences, and thru the expressions of these various opinions practical solution of the particular problem at hand is obtained. It may be difficult to get students to recite and express themselves at the blackboard. A free discussion of the point at issue makes the student lose his self-consciousness, and before he is aware of it he is at the board illustrating his particular method of solution. Of course, such discussions are under the wise guidance of the teacher.

Provisions should be made for students who cannot attend but once or twice a week. It is quite common for students to stay away because they can not attend regularly. This applies to a great many textile workers. In prosperous times the mills are run evenings and the employed are expected to work overtime. But they can usually get away for one night in the week during such times. They cannot always tell definitely what nights they will be called upon to work. Students who are working overtime should be allowed to attend any night

during the week after the work is fairly started. Such a plan is feasible. Boiler firemen alternate in working day and night. A fireman who works days this week will work nights next week, and so on.

In a word, every effort should be made on the part of instructors to accommodate the changing time schedule of the individual student, and to awaken within him that self-interest in the progress of his school work which will enable him to do the very best of which he is capable.

Unit courses should be very specific. To illustrate: A course in machine shop work should not be made simply a machine shop course but divided into a number of sections or units—like lathe work, plane work, milling work, etc. In this way a hand engaged on a planer who desires may have an opportunity to become a lathe hand. Again: A course in any branch of cotton manufacture should not be simply cotton manufacture, but divided into units as follows:

Picker and card room—50 lessons, two hours an evening.

Combing—50 lessons, two hours an evening.

Drawing and roving frames—50 lessons, two hours an evening.

Ring spinning and finishing—50 lessons, two hours an evening.

Mule spinning—50 lessons, two hours an evening.

Cotton sampling—50 lessons, two hours an evening.

Advanced calculations in carding and spinning—50 lessons, one hour a week.

#### *Weaving and Warp Preparation Departments.*

Spooling, warping and slashing—50 lessons, two hours an evening.

Plain weaving and fixing—50 lessons, two hours an evening.

Fancy weaving and fixing—50 lessons, two hours an evening.

Weaving and fixing (French class)—50 lessons, two hours an evening.

Weaving and fixing (Portuguese class)—50 lessons, two hours an evening.

Advanced calculations in weaving—50 lessons, two hours an evening.

#### *Designing Department.*

Elementary designing and cloth construction—50 lessons, three hours an evening.

Advanced designing and cloth construction—50 lessons, three hours an evening.

Jacquard designing—50 lessons, two hours an evening.

#### *Knitting Department.*

Special knitting—50 lessons, two hours an evening.

This presentation will serve not only to catch the eye, but it will offer an incentive.

Evening instruction should be divided into departments. Each department should have a head and one or more assistants. Opportunity should be provided for a student to take one subject called a major and one or two related studies called minor. To illustrate: A young man enters a class for machinists. He finds difficulty in reading blue prints and handling fractions. The major subject is machine shop and his minor is blue print reading and arithmetic. It is better for a student to take all of his subjects in one department. It is this major subject which has drawn the student into the school and it is this which will keep him there if, along with it, one or two related subjects are brought in a practical way by the teacher or his assistant of the major subject. The time to teach fractions will be when they come up in connection with the shop work. Then the teacher's assistant may take a group in another room or to a blackboard and explain it to them. With a little drill they will profit by the instruction.

Evening technical instruction in order to be effective must combine closely practice and theory thinking about the practice. Since the student attends to meet some definite need, it is usually something closely related to his daily work. Practical training in his trade affords, in addition to skill, an apperception, that is, a body of experiences that give interest illustration, insight, grasp, application and permanent working mastery to rules, principles and theories. Without a body of practical experience preceding or accompanying it, technical education is to a large degree, in spite of the claim that it may be useful later in life, a pure abstraction that is neither interesting nor tangible, so that evening technical classes should be for those engaged in the trades and old enough to profit by the instruction. Experience shows that pupils under 17 years have not profited by evening instruction. The great body of physicians, social workers, etc., confirm this experience by saying that children that work during the day should have their evenings free.

A great many people that are "handy" or mechanically inclined and not engaged in the trades have been able to profit by evening instruction. They have used the small amount of instruction received in the evening shops in addition to their natural ability to obtain positions in the trades. In this way evening technical classes have served for people not engaged in trades as a port of entry into the trades.

*The motif for study must be a knowledge of its value.*





# MAKING DRAFTING-ROOM EQUIPMENT

F. Theodore Struck, Head Teacher, Essex County Vocational School, West Orange, N. J.

**W**HEN the Essex County Vocational School was organized three years ago we were given a school building that had been used for an intermediate school. About the first thing we did was to begin altering the building to suit our needs. Among other things it was necessary to instal a new heating plant, run new electric-light signal and power circuits, extend our water supply system, remove and alter partitions, reinforce floor systems, and make and instal various kinds of machinery and equipment. Most of this work was done by the boys of the school under the immediate direction of experienced tradesmen who have had educational training and experience as well.

As regards drafting-room equipment we felt that the boys ought to be given the opportunity to make it. Some of the factors to be considered were: First, educational value; second, speed (we could not wait long for it); third, economy; fourth, durability.

Many excellent designs of drafting tables have been published from time to time in the *Industrial-Arts Magazine*, but they did not seem to meet our particular needs as fully as was desired. The outstanding features of the table shown in the photograph, and drawing, are that it is simple of construction, can be made quickly, and is light and durable. It is more rigid than most folding tables, and is about as convenient to transport and instal in industrial or other centers where it may be desirable to conduct continuation, or part-time classes, as the latter.

At the time the tables were made the students were novices both in drafting and in carpentry. Instead of asking the boys to work out designs they were given blue-prints to work from. These were explained, and by means of a class demonstration and of individual help the boys were taught how to obtain the lengths and bevels required in the lay-out of the table legs by means of using their steel squares. In similar manner they were taught how to proceed with the rest of the construction.

For this particular problem we did not follow the specialized shop method of production, but selected a boy who acted in the capacity of foreman, and another who served as helper for each table that was to be made. These performed all of the operations involved. The same boys made out a bill of labor and material on special forms; but not until the job was done were the lads asked to figure the cost of production. This plan was not intended to be permanent. As soon as the ability to readily read blue-prints is mastered it is well to ask for an estimate of material and cost before the job is begun in the shops. The material used in this case was white pine, finished with two coats of orange shellac. Other woods or finishes may be more desirable in other localities or



The Author's Drafting Room.

where the requirements differ from those obtaining in our school.

The use of drafting tables of the type described necessitates the use of either open racks or of cabinets for storing drafting boards. The drafting-room cabinet, of which a drawing is shown, is a unit cabinet designed for twenty students. It is designed to hold instruments, boards, completed drawings, and stock. Its compactness and the ease with which it may be moved from place to place commend it for use in continuation, part-time, and evening school centers which do not have proper storage facilities for drafting equipment, and it may be used to advantage in shops that employ drawing table arrangements for woodworking benches such as those described by Daniel Shirck in the July, 1916, number of the *Industrial-Arts Magazine*, page 316, and by R. E. Abercrombie in the December issue of the same year, page 552. If desired, the shelves intended for paper may be provided with a door, and the cabinet may be made in separate sections, one to fit over the other.

All drawers and doors ought to be provided with master-keyed mortise locks, and the drawers with drawer pulls. Name plates on drawer fronts will save possible confusion. It will be noticed that the back of the cabinet is made up in two distinct panels. This is very desirable as keys may be broken in the lock, thereby rendering a master-key useless, or triangles and instruments may be so placed in the drawers as to preclude opening the same in the usual manner. By having a removable screwed-on paneled back such difficulties may be readily overcome.

For all visible parts oak looks well and is serviceable. Drawer parts other than the front may be made of a lighter wood such as white pine or white-wood. The finish will naturally depend in part upon the kind of wood used.

Drawing boards made as indicated in the drawing can be stacked compactly. The provision made in them for expansion is especially desirable when the boards are made up of stock that is not thoroly dry.

To touch on the educational aspects for a moment, it has been our experience that the boys are decidedly interested in this and other forms of practical work. They are proud to use the equipment they personally made, whether in the drafting room, in the shops, or in other parts of the school plant. This feeling of personal interest holds also, tho perhaps to a less extent, in the case of product made by the specialized factory method, and where the entire class is used as a unit to perform a certain

piece of work. There is little doubt that vocational interest and skill thus developed also reflect themselves in increased interest in related classroom work.

It is realized that the type of work described has its educational and vocational limits as well as advantages. We have tried to so arrange the work that it serves the two-fold purpose of contributing directly and specifically to a boy's vocational needs, and of stimulating him, and of demonstrating to him the need for a more extensive and a more intensive knowledge of trade-technical subjects, as well as to show him that good citizenship demands active support, thru various social institutions and agencies, of all that helps to support, to improve, and to perpetuate our government.

## FARM MECHANICS

M. A. Cromwell, Belt, Montana



THE problem of changing the work of manual training to farm mechanics in agricultural communities is a live one. Time is here when agriculture and farm mechanics will be given more attention in schools that draw support from the country. Heretofore we have been educating pupils away from the farms instead of for them. Besides, the powers that have made the course of study have failed to see that a little education along farm topics was as good for the city pupil as learning based entirely upon city environment.

In the Belt Valley, Montana, High School I have been working out some plans for farm mechanics that evolve problems of actual farming and a variety of shop and outside work. There are many reasons why a teacher of farm mechanics should have farm experience in the section where he teaches.

### Conditions Change Construction.

I formerly lived in Iowa—the corn and hog center of America. I knew the arrangements for horses, cattle, hogs, poultry, and the plans that had to be made for buildings and equipment there. I knew that the average farm wagon was 2½" or 3" skein and I had never seen a 3½" wagon on a farm in 25 years. There were no brakes on wagons, the tires seldom wore out, narrow track was always used, and large boxes were common. Scoop boards were a part of every corn outfit and every farm had corn.

In Montana we have many 3¼" and 3½" wagons, all have brakes, tires are badly worn on stony roads, we have only wide tracks, which means a wider box; we seldom use the large top boxes and a scoop board is almost unknown. This is the wheat belt. We have to shoe horses more, protect stock and farm tools in a different way, feed different rations, and build different from Iowa. Then the kind of material to work with is different. Iron is high, lumber cheaper than in most places. Repairs are different, and without

experience at farming my plans would have been like guesswork.

Most of the ranchers of the west have a blacksmith outfit and shoe their own horses as well as do most of their farm blacksmithing. So every farm boy should be taught these things in the west, but that might not be true of other communities. So I think farm experience is a prerequisite to teaching farm mechanics. Choosing class problems, without farm experience, would be hard, indeed.

### The School Allies.

The Belt Valley High School tries to be practical. More than that it utilizes every facility in every way possible. The district goes into the country and the farmer comes to school, some a week at a time, some six weeks and some two years in agricultural courses, but all courses have a leaning to the agricultural interests—good housekeeping and good farming.

So the manual training was in line to take that trend. To promote it we introduced farm mechanics and farm carpentry. The first was elective for those who wanted to take agriculture. The latter was required from all freshmen.

In farm mechanics we try to do the practical things on the farm that require testing material and machines, making and repairing equipment and buildings; and field work at fencing, plotting, and measuring tracts, drainage, heating, and similar work on the farm. In fact the problems are largely determined by local conditions. The course is planned for a year's work besides the year in freshmen farm carpentry, with feed racks, wagon boxes, hay racks, colony houses and a complete set of the larger farm buildings—house, barn, granary, machine shed, hog house, chicken house, and any other practical buildings required in the community. In this work a plat of the farmstead is drawn first, the buildings are located and the roads and fences planned. Following this the buildings are drawn with

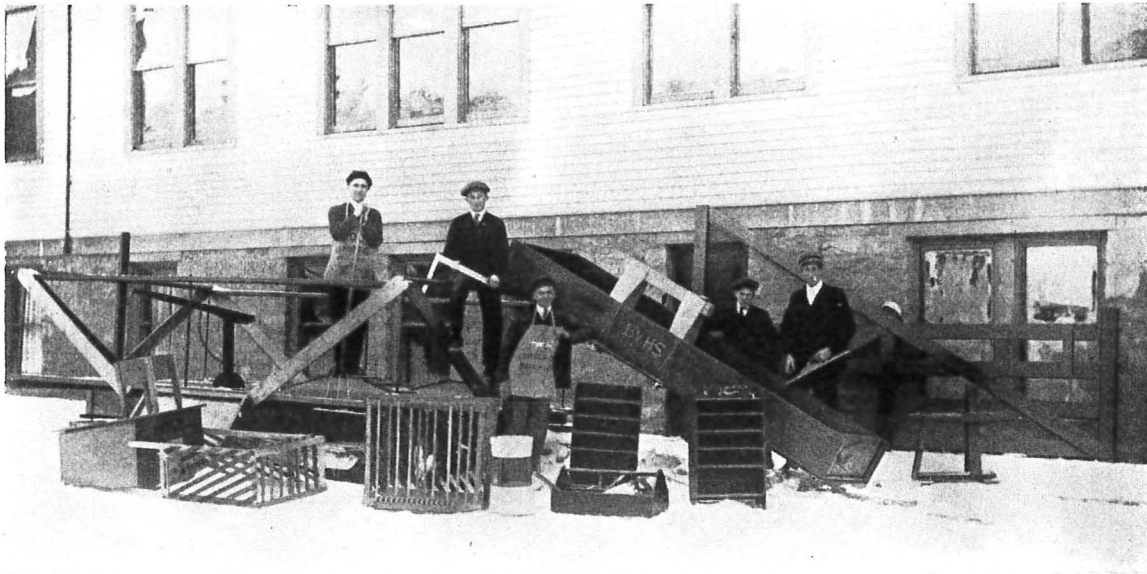
details enough to enable a stranger of the plans to work them out completely. Along with this, the farm shop is worked out in detail and a proper equipment is planned.

The above involved a course in mechanical drawing that is definite and practical. It makes a lot of work for the teacher, but he is supposed to know his part before the class gets to it.

Most of the farm boys have a considerable amount of this course from practical experience. The problem is to give them a better understanding of what they want to do and enable them to go about

#### Conservation and Correction.

A large part of this work is making over something. It involves a lot of work, but it is practical. Wagon boxes are made over, wagon jacks made from other discarded machines, and no material that can be used has been wasted. This has been emphasized. The wagon boxes made over were very much better than those made by manufacturing firms to sell. That means something here, where a box sells for \$40. It means more than dollars, for it means the making of something like a jack of all trades to save the waste material on a farm.



ARTICLES MADE IN THE BELT HIGH SCHOOL FOR FARM USE.

it with a store of definite views on the subject. It requires considerable extra work for some boys to come up to a high standard if they have not had farm experience, or have not had a chance to know when a job is done right.

This year practically all the construction and repair work has been done on the school buildings at the high school and auditorium. Nearly 100 chairs have been repaired, doors, locks, lockers, floors, domestic science, athletics and other things have been looked after. Enough attention is given to outside painting to enable a student to know the what, when, and why of painting and wood preservation, on posts, boards, machines or buildings.

#### Tying to a Trade Mark.

When a piece of farm equipment is made it is marked with the school colors—orange and red. A gate has the color and stands out in its country home as an emblem of loyalty to the school. The wagon boxes have the colors and B. V. H. S. is lettered on the side to indicate the source of production. Orange and red will be a common combination in this locality if this plan can be kept going. Some of the girls in high school have been enlisted to do lettering and are glad to do it at odd times when their work does not need them and they want to get a change of environment. They like to do it as a matter of loyalty to the school.

## THE AMERICAN'S CREED

**I** BELIEVE in the United States of America as a government of the people, by the people, for the people; whose just powers are derived from the consent of the governed; a democracy in a republic; a sovereign nation of many sovereign states; a perfect union, one and inseparable; established upon those principles of freedom, equality, justice and humanity for which American patriots sacrificed their lives and fortunes.

I therefore believe it is my duty to my country to love it; to support its constitution; to obey its laws; to respect its flag; and to defend it against all enemies.



# VOCATIONAL DEPARTMENTS IN HIGH SCHOOLS OR SEPARATE VOCATIONAL SCHOOLS?

A. E. Henning, Polytechnic High School, Santa Ana, Calif.



FOR our purposes high schools could be divided into three types: (a) the high school of yesterday, (b) the high school of today, and (c) the high school of tomorrow. The separate vocational schools could likewise be divided into two types as follows: (a) the narrow, and (b) the broad.

The "high school of yesterday" is the high school that has existed from the beginning of high schools and still exists unaltered. It was first organized at the time when education, enlightenment and progress had not achieved their present scope nor made their present demands upon the schools in general and the high schools in particular. The "high school of yesterday" was adapted to the time when a person who had received an eighth-grade education was considered well equipped to fight life's battles or solve its problems, and when high school education was not looked upon as essential to success in life, but as distinctively for those who wanted extra mental equipment for college entrance, into the arts and sciences, or for those who wanted to pursue the study of the arts, the classics, the languages or literature, etc., as a pastime rather than as a means of livelihood.

The "high school of today" is the high school that has realized its shortcomings and inadequacy properly to prepare its students to meet and solve life's bread and butter problems, and has added to its curriculum some or all of the following courses: Mechanical drawing, manual training in all its phases as related to wood and metals, cooking, sewing, dress-making, millinery, typewriting, bookkeeping, stenography, etc., in an attempt to adjust itself to the progress and demands of today. Such modification recognizes the fact that today it is just as essential for people to have a high school education, in order to meet the demands of society while in pursuit of a career or livelihood, as it was to have the grade school education in the bygone days. Altho this type of high school has added these new features to the old and has recognized its new responsibilities, it has not, however, undergone a complete reorganization and does, therefore, not as yet perform its new duties or carry out its new functions in the best organized manner.

The "high school of tomorrow" is the high school that has fully realized that we are forcing three-fourths of our population into the actuality of trying to make a living without the slightest preparation for the work or understanding of the task, while at the same time we develop an attitude of superiority toward practical things on the part of a few—a superiority which does not express itself in any knowledge, sympathy or culture which is able to manifest

itself in any helpfulness or even genuine satisfaction. In view of the foregoing this type of high school has effected a complete reorganization and assumes the duty of preparing its students to solve life's problems, equip them with productive knowledge, and acquaint them with social, industrial, economic and political conditions.

Both types of the separate vocational schools must be assumed to be organized in conformity with the meaning and intent of the term vocational education which, as defined in the Reports of the Committee on Terminology, National Education Association, 1914, means any form of education whether given in a school or elsewhere, the purpose of which is to fit an individual to pursue effectively a recognized profitable employment. The definition, due to the word "effectively," permits of the establishment of (a) the narrow type, or (b) the broad type.

The narrow separate vocational school would be a school where only the trades, home economics and industrial pursuits would be taught unsupported by related topics on general educational subjects as was done in the old type trade school.

The broad separate vocational school would be a school where the trades, home economics, commercial, and industrial pursuits would be taught and supported by related topics such as mechanical drawing, blueprint reading, industrial history, economics, civics, sociology, etc.

Whether or not the addition of vocational departments to the various types of high schools would be successful in solving the problem is a question upon which the following table will throw some light.

## *Attitude of the High School toward a Vocational Department.*

(Based on previous classification.)

Considerations.	"A" Type High School.	"B" Type High School. Half and half	"C" Type High School.
Is the chief aim of the High School to equip its students for College?	Yes	Half and half	No
Would a Vocational Department be welcomed by the faculty?	No	Half and Half	Yes
Would a Vocational Department be welcomed by the students?	No	Yes	Yes
Could related topics be so taught as to assist in correlating the vocational with the academic?	No	To a limited extent	Yes
Would a Vocational Department be a success?	No	Yes	Yes

The above table has been introduced to show that the success of vocational departments in our high schools depends upon whether the insight and courage of our teachers and those engaged in high school administration has increased sufficiently for them to overcome their dislike towards vocational instruction to welcome vocational teachers to their midst, and to enable them to adapt their supporting branches to the needs of the vocational students. The table likewise shows that without the consideration of the

merits pro or con, it would appear to be beyond reason to expect a vocational department to be a success if added to the (a) type of high school, but if added to the (b) and (c) types of high schools it would be a success.

Whenever a change is being contemplated in any line of endeavor the first fact to be considered is the cost, so naturally this "bugbear" enters into this discussion and must be dealt with. The separate vocational school is bound to mean, to a varying degree, the duplication of plants, apparatus and machinery, supporting subjects and teaching force. This is especially true in all places except the large cities. So it can readily be seen that insofar as the expense involved is concerned the separate vocational school is the more expensive.

Vocational education as a department of a high school would permit it to assume the broader aspect. The vocational students need the opportunity of choosing supporting lines of information such as English, drawing, mathematics, industrial history, economics, civics, sociology, industrial geography, political science, etc., which the general high school alone can offer. On the other hand, the students pursuing academic lines need the opportunity of electing vocational branches even if taken for avocational purposes. This interchange in courses would have a tendency to promote a better feeling or spirit between the students pursuing the two different courses. Again, the separate schools would tend to create the idea that the high school was for the wealthy or the future capitalists and employers while the vocational school was for the future laboring class.

If the vocational work were taught in the high school, many students would select and pursue the vocational courses who would not attend a separate vocational school because of the feeling of class distinction. Therefore, to teach the two in one system would be the more democratic method.

In separate vocational schools the efficient and skilled shop-trained mechanic, the successful business man, and the practical farmer, who are thoroly ca-

pable of teaching their particular lines of endeavor, could be retained as instructors, while most of them could not be utilized in a vocational department of a high school, because they could not meet the educational requirements demanded of high school instructors. This is a strong argument in favor of the separate vocational schools because the students are being trained for industry, business and agriculture, and should be trained by the best equipped instructors. Industry, business and agriculture would prefer to have them trained by the practically educated instructors rather than by the theoretically trained.

The greatest argument in favor of the separate vocational school is that it can lower its entrance requirements so that the large percentage of students who, thru economic necessity are forced to quit school at the end of the eighth grade, can anticipate this condition in the majority of cases and enter the vocational school a year or two earlier, and receive vocational training along some particular line that would be of far greater value to them thruout their lives than the ordinary seventh and eighth-grade training.

A summary of the merits in favor of a vocational department in a high school are: First, that it could be taught successfully and in a broad sense in a department of a high school; second, it would be less expensive, especially outside of the large cities; third, it would permit students in academic courses to take some of the vocational subjects; fourth, it would afford greater opportunities in general education along with the vocational; fifth, all the work would be under one organization; sixth, it would be the more democratic method of the two.

A summary of the merits in favor of a separate vocational school are: First, it would not require much additional expense in the large cities; second, it would greatly benefit a large number of grade-school students, who usually drop out before reaching the high school; third, it could utilize the best equipped teachers; fourth, it would be favored by business and industry as being the better method.

## CHANGE OF ADDRESS

**S**END your Summer and Fall addresses promptly to Milwaukee to guarantee the regular delivery of our Magazine during the next six months. The war has added greatly to the burdens of the post office department and we urge your cooperation to assure the regular receipt of every issue. We cannot hold ourselves responsible for the delivery of your papers unless you notify us of your changes of address as soon as possible.

# SECURING EFFICIENCY OF THE WORKMAN IN THE MANUAL TRAINING SHOP

C. E. Howell, Jacksonville, Fla.



INDUSTRIAL America has recently been swept by a wave of so-called scientific management, with the object of securing absolute, scientific efficiency of the workman and employee. In numerous factories physiological and psychological experiments have been carried on, resulting in a revelation of great wastes in the old methods, and of possibilities for wonderful economies by the use of new.

It was with these facts in mind that I stood one day in a modern high school watching a class file into the mechanical drawing room. The scene and the procedure were typical of the standard practice of today, neither better nor worse than that of the average of such classes in similar schools thruout the country. But, now that I began to view it from the aspect of scientific management, there appeared many things that were utterly inconsistent. Perhaps not so much in any one way, but certainly in the aggregate, there was an appalling waste of time, and an enormous lack of application.

Let me illustrate. As I glanced around the room I saw at one desk a lethargic dreamer, slowly drawing his working materials out from the locker, one by one, and stopping between times to gaze out of the window with a far-away look in his eyes. In sharp contrast, over there was a hustler, full of energy, and already hard at work. Near by, an idler strolled to the teacher's desk, and sharpened the same pencil over and over, while he whispered asides to every entering pupil who passed his way. And outside the door came the last lingerer of them all, keeping the teacher waiting while he stopped to drink at the sanitary fountain across the hall.

Thus my first test for scientific efficiency uncovered abundant material for serious consideration. I had found a large waste of time at the very beginning of the work period. Continued observation revealed similar conditions thruout the instruction period which followed. Practically every student frittered away more or less time, some in one way, some in another, not necessarily in a bad manner, or one worthy of severe reproof, but thoughtlessly, and without deliberate intent. Clearly they had very little appreciation of the value of the time element, or of the possibilities of the results obtainable by industrious and constant application to work.

The environmental conditions were all favorable, as usual school conditions go. The teacher was efficient, thoro, and had an interesting personality. The work had evidently been carefully planned, was thoroly motivated, and skilfully presented. The class, as a whole, was attentive, with no sign of disciplinary trouble. Nevertheless, thru it all there was, on the part of the pupils, a certain lack of a purpose to obtain results, an unconscious wasting of

time, which produced a cumulative inefficiency of large proportions. This was none the less dangerous because unnoticed. Every boy worked, but every boy did not *really* work. Perhaps it was not so much that he actually wasted time, as that he failed to utilize it to the best advantage. Some vital element seemed to be lacking; that element which is akin to the flick of a whip to a lagging horse, or the touch of the accelerator to a gasoline engine.

The close of the class period brought a repetition of the conditions which prevailed at its beginning. Some boys stopped a minute or two early, and others worked right up to the last. Here was more time wasted, more inefficiency, and an unequal distribution of labor.

A careful summing up of these results of my first tentative observations, led me to a determination to continue them in the other shops of the school. In these other shops I found similar conditions, added evidence of the waste of time in the opening and closing moments of class sessions, and of lackadaisical methods on the part of the pupils. By the time my investigations were finished I had a really alarming pile of information, all of which forced me to the conclusion that our school shops were very far from being ideal with reference to the application of scientific management to their workmen.

Having found the conditions, the next thing was to seek a remedy. It was clear that manufacturers and business men would not tolerate similar inefficiency in their affairs. Therefore, as a leader in a preparatory school for the real activities of life, it was obviously up to me to try to formulate a scheme for rectifying the erroneous habits which we were allowing the boys to form. At the outset this problem divided itself into three parts: first, the element of time value; second, the element of industry, or of industrious application to the task in hand; third, methods or short cuts to be used in operations. Of these the first two only concerned our present problem as touching the students, the one of short cuts in operations belonging almost entirely to the teacher.

In seeking a solution for the first two, I naturally turned to the factory for suggestions, realizing that they must have had to meet essentially these same questions of economy of time, and of industrious application. Their cry was increased production, and, in the final analysis, ours was the same. I found that the factories, for the most part, took care of the time element by means of the time clock. A brief consideration convinced me that that method was too expensive for us, so I resorted to the simple expedient of having the boys register their time in and out of the shop, on time pads provided for the purpose. From this it was only a step to the registering of the date, and the number of the job upon which they







The Bi-weekly Payroll, Illustration No. 5, was printed on a white sheet 8½"x11", with yellow insert carbon copy sheets, 50 sets to a pad. Space was provided, as shown, for recording the summaries of four complete jobs for each workman, a new line being used if more jobs were worked upon in the two weeks. When a job was finished, it was so checked in the space provided, otherwise it remained open. We desired to keep track of the total time spent on each job, therefore the column for extra time, even altho this was without pay. The columns headed Total Time, Amount Paid, and Average Rate, were for that two weeks only, whereas that headed Actual Balance, was for the entire semester to date. At the bottom of the sheet, as shown, was a space for the previous number of minutes the shop had been open, i. e., the minimum time for that particular class up to the beginning of that two weeks' period, as taken from the Master Time Cards (Illustration No. 4),

and the previous Bi-weekly Payroll. Opposite appears a place for the minimum wage to date, i. e., for the number of minutes just given, figured at the minimum rate of 17c per hour. Then below is a space for the number of minutes the shop was open for these two weeks, and opposite that the corresponding minimum wage for these two weeks, both of these being figured as above. This Bi-weekly Payroll was filled out and calculated entirely by the commercial department students, they securing the data from their books, which had been kept posted day by day from the Daily Shop Cards, Illustration No. 2.

The originals of the Bi-weekly Payrolls were sent to the shop teachers every two weeks, together with corresponding pay checks made out to each boy for the amount due him. The form of these checks is shown in Illustration No. 6. In addition to the usual items appearing on the ordinary bank check, they carried spaces in the upper left corner for the entry of the individual actual balance of that boy at the time the check was issued, and, immediately below, for the entry of the minimum balance, or least amount he should have earned and had on deposit by that time. Thus each boy had a direct comparison on each check, showing him at a glance whether he was ahead of, or behind, the sum he should have had on deposit at that time.

On certain specified days the commercial department opened their "Industrial School Bank" for the deposit of the above mentioned checks. A small deposit book was furnished each depositor, and all the requirements of a regular bank were observed. It was really surprising to see the number of boys who did not know how to endorse a check or make a deposit.

The Job Card shown in Illustration No. 7 was devised so that the shop teacher might have a complete summary of each job as it was finished. Immediately upon closing any job on his books, each bookkeeper filled out one of these Job Cards, and sent it to the shop teacher, thus furnishing a thoro and useful summary. The card shown in Illustration No. 8 was used for a permanent record of the entire semester. It was filled out by each teacher by copying from the individual Job Cards, and was accomplished in a surprisingly short time. These permanent cards were then indexed, and kept on file in each shop, affording a complete handy reference as to the work of any pupil. At the end of the semester the shop teacher noted, upon the back of each card, observations as to the ability and character of the pupil while in his shop, and sent the entire lot to the director's office, where they were permanently filed for future reference as to scholarship, or recommendation for positions outside of school.

In summing up the results of the entire system as it has been described, I wish to say that we found the following points of merit:

1. It impressed the boys with the necessity for

starting work promptly, and for not quitting before the bell rang.

2. It acted as a very decided spur to keep them busy all the time.

3. It gave them some idea of the relative value of different workmen to the employer.

4. It emphasized the qualities which secure the highest wages.

5. It eliminated all complaint of, "I didn't know I was failing."

6. It left no "come-back" for the boy as to his record, except to say that the teacher's judgment in rating him from day to day was erroneous.

7. It automatically took care of all absences.

8. It eliminated practically all questions of discipline. If a boy talked when he was not supposed to, all that the teacher needed to do was to walk over at once to the boy's desk, and enter a low rate for that day; not a word was necessary.

9. It provided a quick and accurate check on any student's work at any time.

10. It gave the students an insight into industrial conditions, and banking methods.

11. By means of all of the above it very materially lightened the burden of the shop teacher, and

12. It resulted in a truly wonderful tuning up of the *spirit of work* in all the shops.

The commercial department welcomed the chance to put their pupils to work on a problem so well motivated as this one was. It had fully as much merit from their standpoint as from ours. In some instances it might be impossible to obtain the co-operation of a commercial department. Such conditions would not, however, bar the operation of the above plan in a modified form. The bookkeeping and the number of reports would have to be materially reduced, and some of the calculations would be thrown onto the pupils in the shop classes, but the idea as a whole could be carried out by using the calculations of average rates, instead of the total sums, thus making a short cut to very nearly the same results.

Finally, I hope some day to see this entire plan carried out to its logical completeness, that is, so that each boy shall go *on*, never *back*, and so that a piece of work once finished satisfactorily shall be credited, and never have to be repeated. In other words I hope to see a condition where there will be no failures at the end of a semester, which will involve the consequent lost motion of going back again over the entire semester's work, but a steady, continuous progress which will allow alike for the fast and the slow. While such an ideal will be extremely difficult to attain in the midst of the complex academic-subjects problem of our modern cosmopolitan high school, I have faith to believe that some day, somehow, we shall reach it. Meanwhile, this plan which I have just presented seems to mark a long and valuable stride forward in the right direction.



# ECONOMY OF TIME IN TEACHING SEWING

Janet G. Cation, Iowa State College, Ames, Iowa



If one had been told a few years ago that class instruction was possible in teaching sewing, one probably would have remarked, "How can one expect girls who do not have the same preparation to sew uniformly? One has girls in a high school class who have sewed in the grades, and others who have never held a needle, and cannot run a sewing machine. Can one expect to keep them together?"

"Then again, even girls with the same background do not sew uniformly. Harriet and Mary have been in the same class for three years; yet recently, Harriet made a French seam in half an hour, while Mary hadn't finished hers in an hour and a half."

Experience proves, however, that class instruction saves time and energy, and is an excellent method of teaching sewing, both in the grades and high school.

## Have a Uniform Pattern.

If this method is used, the first requirement is a uniform pattern.

We formerly urged girls to make everything different. This was often a difficult task, for we all know how a class is swayed by the choice of a popular girl.

At first it seems as if the use of a uniform pattern would make the work very monotonous. Experience does not bear this out, however.

A freshman high school class has recently completed nightgowns. All used the same pattern, varying only the neck finishes, where the girls chose a binding, or facing on the right, or wrong side. Each girl, too, chose a simple design in handwork. In criticising the results, the recommendations were, that when we repeated the problem again, we should not even vary the neck finishes.

Last spring our eighth-grade class made gingham dresses, using a uniform pattern. There was such a variation in materials and combinations of materials, that one didn't get the impression that they were alike. Another eighth-grade class has recently made serge middies, while still another group has made military middies out of khaki colored material. From a teaching standpoint, the results are so much more satisfactory than where the girls used different patterns, that, hereafter, in high school classes, the use of uniform patterns would seem advisable.

The girls look extremely well in their serge and khaki middies. They like them too, because they signify to the rest of the school that the girls are in eighth grade, and most of them wear these blouses constantly, altho they are not required to.

Middies are excellent for school wear and form a good foundation for talks on the suitability of dress.

There are always, to be sure, the problems of the fast and slow workers, and of the conscientious,

and careless workers. How shall we meet these? One way is to have a drawer of supplementary materials. It may contain such things as holders, pen cases (used in the grade rooms) and babies' clothing for the associated charities. If a girl finishes the unit for the day before the hour closes, she will find something to her liking in this drawer. A grade girl, for instance, will be interested in the pen cases used in her room, while the high school girl may like the baby clothing for the associated charities.

This drawer should have a changing variety of interesting things in it. Many of us have erred in having girls continually hem towels for supplementary work. Is it any incentive for a girl to finish a piece of work in the shortest possible time, if at the end of that time, we always require her to do such monotonous work?

One often finds a girl who sews both rapidly and well. In such a case, it may seem advisable for her to have her own supplementary problem, and make an extra garment for herself.

## Know the Pupils.

The second requirement in keeping a class uniform is to know the pupils as well as possible. This may be done by making a careful study of each individual in the classroom and also finding out as much as possible about her home life.

One teacher makes this statement, "Until recently, if Harriet did a piece of work in one-third the time it took Mary, I paid little attention to it, and Mary probably didn't know it. Now, it is my problem, but also Mary's. I must find out her handicaps, but must put the responsibility of overcoming them onto her."

"Thru observing her closely, I find that her chief difficulty is not in sewing slowly, but in losing time all thru the lesson. When the lesson is presented, the new unit is so far removed from her that she doesn't feel obliged to pay attention; then when she is ready, she will probably sit waiting, to have the new unit explained to her. She also stops to talk."

Recently a teacher was criticized for letting a pupil make a careless mistake in class.

"You wouldn't wonder at it, if you knew her family as I do," remarked the teacher. "They are shiftless all the way thru. I went to school with her older sisters, and they were always just about half together. Their clothes were pinned with common pins. At home they sit around talking, altho their dishes aren't washed, nor their beds made. I'm afraid we can't teach her much, for carelessness is born in her."

"Knowing these things about Ruth helps you anticipate her mistakes," the supervisor replied. Since you know she is careless, help her first, and do

not, under any consideration, let her cut anything without your approval."

#### Set a Problem.

A third way of keeping a class uniform is to set a problem to be done in a certain time. We have paid very little attention to the time element in sewing, and have consequently allowed our girls to get into slow habits.

If, however, we set a problem to be done in a limited time, the girls are much more apt to accomplish it. The time for the unit should be based on past records of the length of time it has taken other classes to do the same thing.

If one keeps a record of what each class does each day, one can, for example, look at last year's records to see how long it took a freshman class to make bound plackets.

Altho one rarely ever gives a problem exactly the same way two years in succession, one can get much help from these records.

As soon as a problem is finished, a teacher should record her opinion of it; which units in it were successful, which were not, and what changes seem desirable, if the problem is repeated next year. These suggestions are helpful in planning her next year's course of study; for she is much more apt to remember them, if she puts them down while they are fresh in her mind.

A teacher who keeps such records has some basis, then, for saying—"Today our lesson will be hemmed plackets."

In the making of seams in a petticoat recently, a class of fourteen girls kept track of their time. When a graf was put on the board, each girl could see exactly where she stood.

Alice was in the lowest group, because she has never sewed before and had to rip a great deal. Mary was there, because she talked and wasted time. Alice, who is very discouraged, was commended, but Mary was given to understand that when the next graf is put on the board it will be to her interest to be in another group.

The study of the grades of the seams is interesting. They ranged from 80 to 93, and were divided into three groups.

Group 1—Grades from 90-95.

Group 2—Grades from 85-90.

Group 3—Grades from 80-85.

Numbering them according to their speed, they are graded in the following groups:

1, 3, 4, and 11 are in Group 1.

2, 5, 6, 8, 9, 10, 12, 13, in Group 2.

7, 14, in Group 3.

This shows that there seems to be no relation between speed and accuracy. Some girls sew fast and well, others fast and poorly, a third group are slow, but very accurate, while some are slow as well as poor in their work.

The following outline shows the plan for the petticoat, and what was accomplished in each lesson:

#### Satine Petticoat.

##### Lesson 1—*Cutting.*

###### *Discussion.*

Laying pattern on cloth.

###### *Laboratory Work.*

All cut petticoats.

##### Lesson 2—*Seams.*

###### *Discussion.*

Principles of putting gores together. (Drawings on board to illustrate.)

Review of felled seams.

(1) How made.

(2) Precautions to make lie flat.

###### *Laboratory Work.*

Basting seams in petticoats.

Stitching seams first time.

Basting felled seams.

##### Lesson 3—(*Continuing 2.*)

##### Lesson 4—(*No discussion.*)

###### *Laboratory Work.*

Continuing felled seams.

(One girl finished in 15 minutes.)

(One girl finished in 40 minutes.)

These girls worked on a school luncheon set. Four finished before end of hour.)

##### Lesson 5—*Hemmed Plackets.*

###### *Discussion.*

(a) Use of Plackets.

(b) Length of Plackets.

(c) Kinds of Plackets.

###### *Laboratory Work.*

All girls measured down 10" and drew threads.

All cut plackets at once.

All basted and stitched narrow hems.

All but three stitched wide hems.

Three finished felled seams.

##### Lesson 6—*Hems in Top.*

###### *Laboratory Work.*

All girls ready for hems in top made them.

Others finished felled seams and plackets.

##### Lesson 7—Red Cross work for those who were thru with previous assignments.

Others continued seams, plackets and hems.

##### Lesson 8—*Flounces*

###### *Discussion.*

Width of flounce and scallops. (See "Clothing for Women," by Baldt, page 237.)

###### *Laboratory Work.*

Cutting widths.

Sewing them together.

Cutting scallops out of cardboard.

##### Lesson 9—*Laboratory Work.*

Turning back a facing.

Marking scallops on skirt.

Stitching scallops on skirt.

##### Lesson 10—*Laboratory Work.*

Turning and basting scallops.

##### Lesson 11—*Continuing Flounce.*

Three finished.

##### Lesson 12—*Discussion.*

Gathering flounce on machine.

Putting flounce on petticoat.

###### *Laboratory Work.*

Seven finished flounces and started gathering.

##### Lesson 13—*Laboratory Work.*

Three girls finished scallops and started gathering.

Ten girls continued putting on flounces.

##### Lesson 14—*Discussion.*

Finish for raw edge of ruffle.

###### *Laboratory Work.*

Seven girls finished flounces.

Lesson 15—*Discussion.*

Fasteners.

*Laboratory Work.*

Seven girls finished flounces.

Seven girls put on fasteners.

Lesson 16—*Laboratory Work.*

General finishing up lesson. Red Cross work for those who finished.

The advantage of class instruction may be summed up as follows:

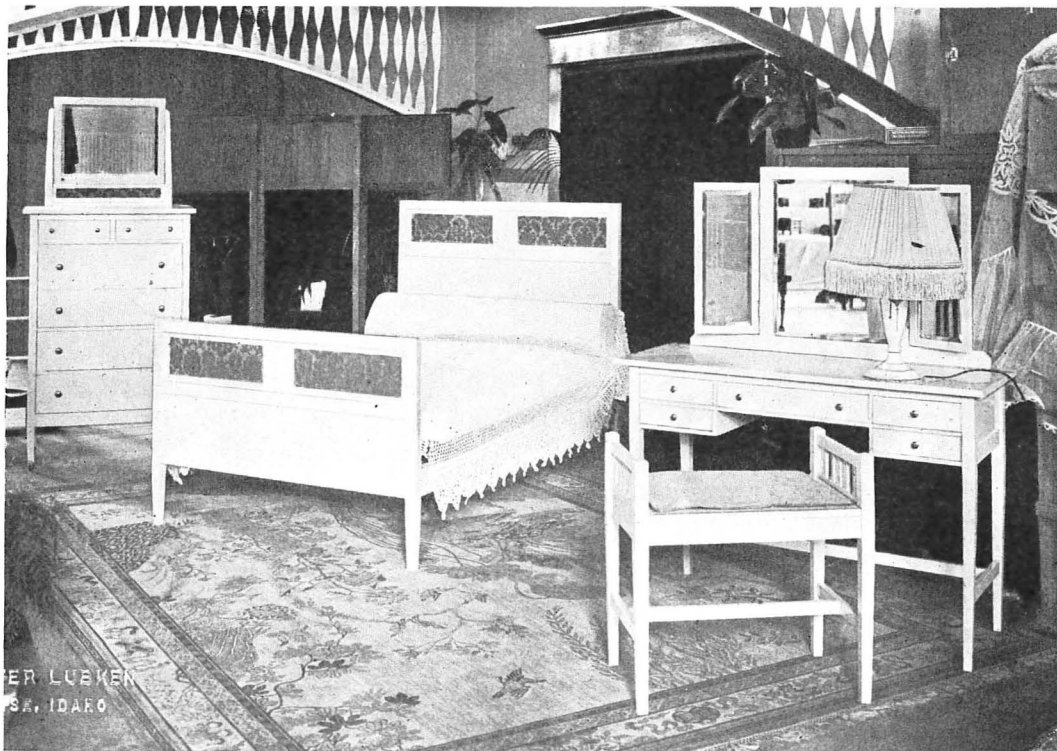
1. The teacher saves time by presenting the new unit at the beginning of the lesson, explaining it clearly and giving necessary illustrations thru blackboard drawings and demonstration of the processes.
2. She has more time for the poorer pupils who need individual help.
3. She is sure that each girl gets a full explanation of the new unit; which might not be possible, if several were waiting for help.
4. The pupil saves time thru not having to wait until the teacher comes to her.
5. Thru the use of the uniform pattern, the teacher can concentrate on best methods for doing each process.
6. She can take into consideration the time element; thus giving the girls a basis for comparing their work with others.

GRAF SHOWING ACTUAL TIME SPENT BY EACH STUDENT ON SEAMS				
		210		
		210		
		205		
		200		
		195	240	
	160	190	235	280
	145	185	230	275
MINUTES	145 - 180	180 - 215	215 - 250	250 - 285

Graf Used by the Author in Her Classes.

7. The responsibility of each girl's work is put upon the girl herself. A graf on the blackboard showing a girl where she stands, is more convincing than any argument a teacher might put forth.

There is an excellent opportunity at the present time for those who have not tried this plan, thru the channels of the Red Cross or associated charities where large numbers of like garments are wanted. If the girls are sewing for themselves, never was there a better chance, with the uniform idea expressed all around us in our daily life, and the increased agitation for standardized dress. Is it not at least worth a trial?



BED ROOM SET MADE BY STUDENT OF THE BOISE, IDAHO, HIGH SCHOOL.  
Mr. Herbert A. Steinke, Director of Manual Arts Department.

# DRAWING IN CLAY

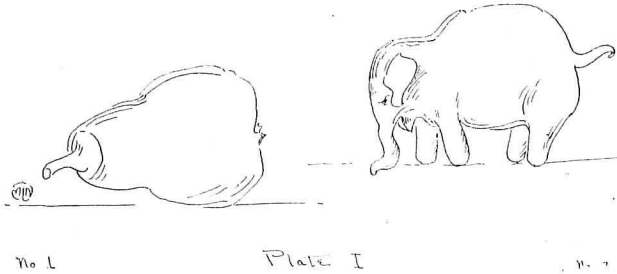
Mrs. C. F. Niles



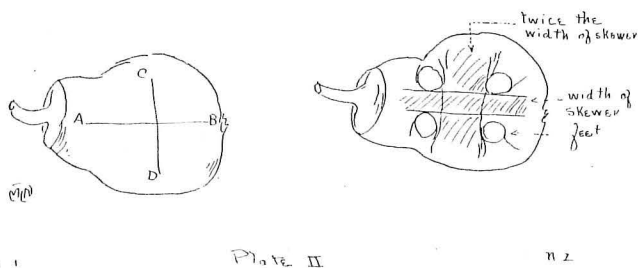
THE following problems were given in a series of lessons at the Stout Institute. Clay was used as the medium in drawing.  
Object lessons.  
Story-telling.

## Illustration.

The study of animals is usually confined to the primary grades, but it is splendid training for accurate seeing in any grade.



The expression work is given in the lower grades. It might well be carried thru all the grades as study composition and illustration.



Any small animal or figure modeled in the round, then placed upon a plinth, may be glazed and fired.

## 1. Object Lessons:

1. Study from animals from life or picture.

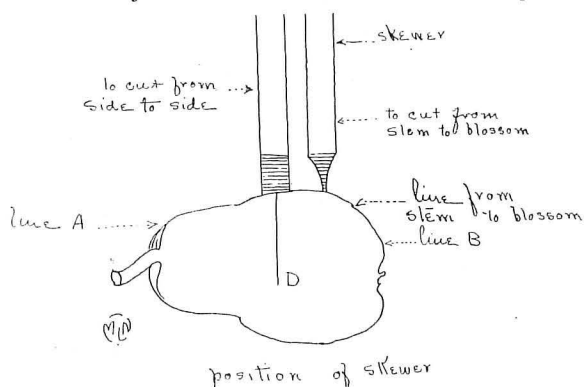


Plate III

Illustration, Plate VII from life. Plate VIII from picture.

2. Fruit from object or from memory. Illustration, Plate IX.

3. Birds or fowl from life, picture or memory. Illustration, Plate X.

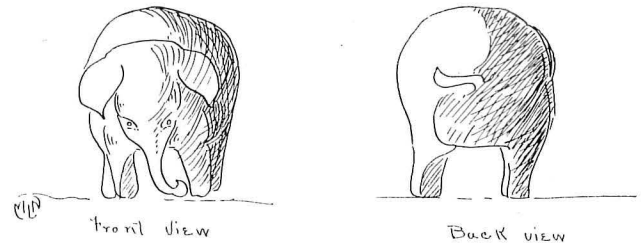


Plate IV

## Method:

Take a piece of clay as large as the completed object in height and width. With a skewer sketch the outline of the object to be modeled. Cut away with

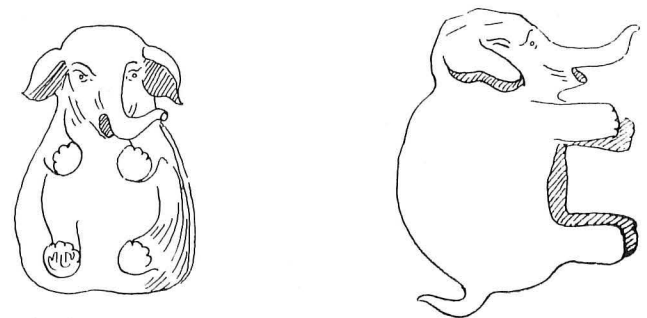


Plate V

a skewer (Illustration, Plate III, *Industrial-Arts Magazine*, Feb., 1915, page 83) to the desired form.

## Good Technique:

For a good texture and finish in clay modeling, do not try to remove all tool and finger marks.

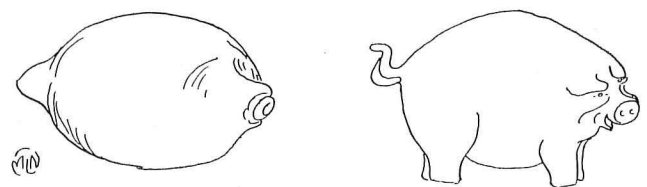


Plate VI

In any of this work, it may be built up piece by piece, altho firmer results are obtained by cutting away.

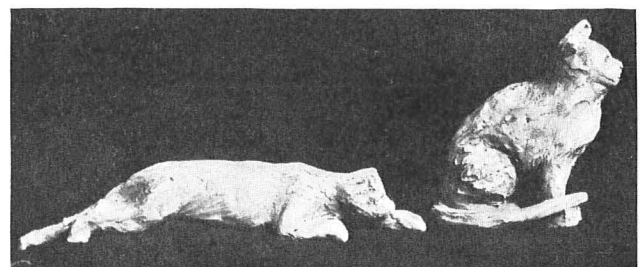


Plate VII.





Plate VIII.

*Problem I.*

Example 1. A pear: Take a piece of clay the size of a pear and cut away with a skewer piece by piece until a pear is formed. Smooth with the fingers until a perfect pear is made. Make a depression at the small end of the pear, for the stem, using some of the bits of clay rolled to form a stem. With a skewer fasten the stem firmly to the pear. At the opposite end from the stem, mark for the blossom

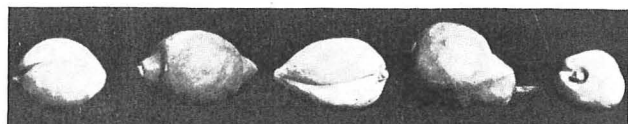
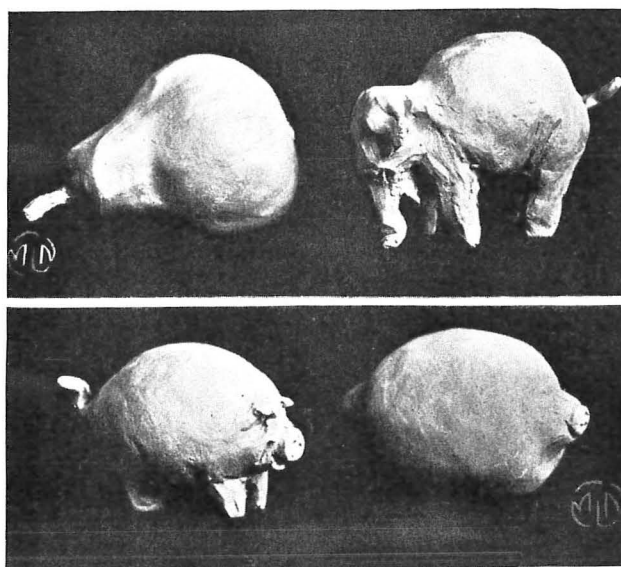


Plate IX.

fragments. The advantage of this method over building up piece by piece is, that the hands take the moisture from the clay; by the time the model is



Plates XI and XII.

finished, there is a difference in consistency of the clay, therefore difference in shrinkage, causing the model to crack.

To change the pear into an elephant: Hold the pear before the class, call attention to the similarity in shape between a pear and baby elephant. (Illustration, Plate I and XI.)

Draw a line from stem to blossom end of the pear. Illustration, Plate II, No. 1, A-B.

From side to side of the pear draw a line. Illustration C-D.

Remove the stem and later fasten it to the blossom end of the pear, for the tail of the elephant. Illustration, Plate IV, back view; Plate XI.

With the broad side of the skewer held at right-angles to the line A-B (Illustration, Plate III), push the clay toward the stem end to form the trunk of the elephant. Illustration, Plate II and III.

With the skewer draw outline of eyes and ears, lifting the ears a little from the head. Illustration, Plates V and VI, front view.

Finish the trunk and draw the mouth. (Illustration, Plates I, V, XI.)

Remove the clay on line C-D twice the width of skewer. (Illustration, Plate II, No. 2.) Build the legs and feet.) Plate II and V.)

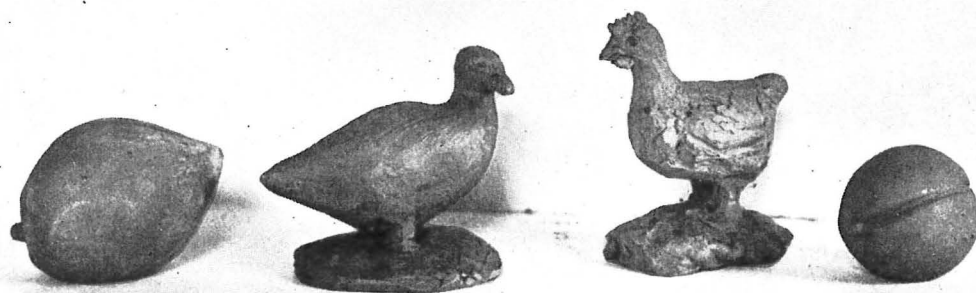


PLATE X.

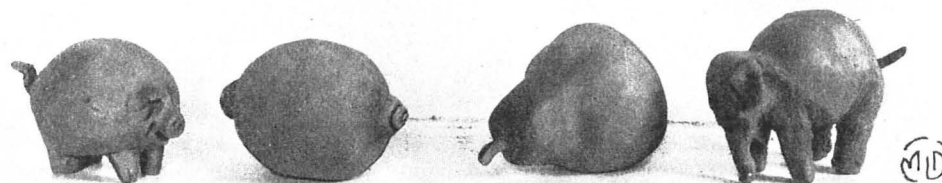


PLATE XIII.

Use only the skewer for this work, taking away and adding clay where needed.

Finish the ears, eyes and mouth. Little tusks may be added.

In story-telling and illustration, first use a simple model. Call the child's attention to the shape of a lemon and a little pig.

Model the lemon, then tell the story of the little

pig that went to market. With a few strokes of the skewer change the lemon into a little pig. (Illustration, Plates VI, XII, XIII.) This little pig cried wee-wee all the way home. Many lessons can be developed from fruit forms to bird or fowl forms. (Illustration, Plate X.)

Delightful hours may be spent in modeling from pictures, all of which stimulates the imagination of the growing child.

## A POWER BENCH GRINDER

G. A. Boate, Formerly Head of Drafting Department, Newton Vocational School, Newtonville, Mass.



THE accompanying detail drawings, assembly and perspective of a small power bench grinder and buffer were made by a third-year pupil of the machinists' division in the Newton Vocational School.

The policy in this school is to bend some energy toward the production of useful additional school shop equipment—so termed; "Economic Vocational Training." The manufacture of this small tool is a splendid project, embracing drafting, pattern-making, moulding and machine shop work.

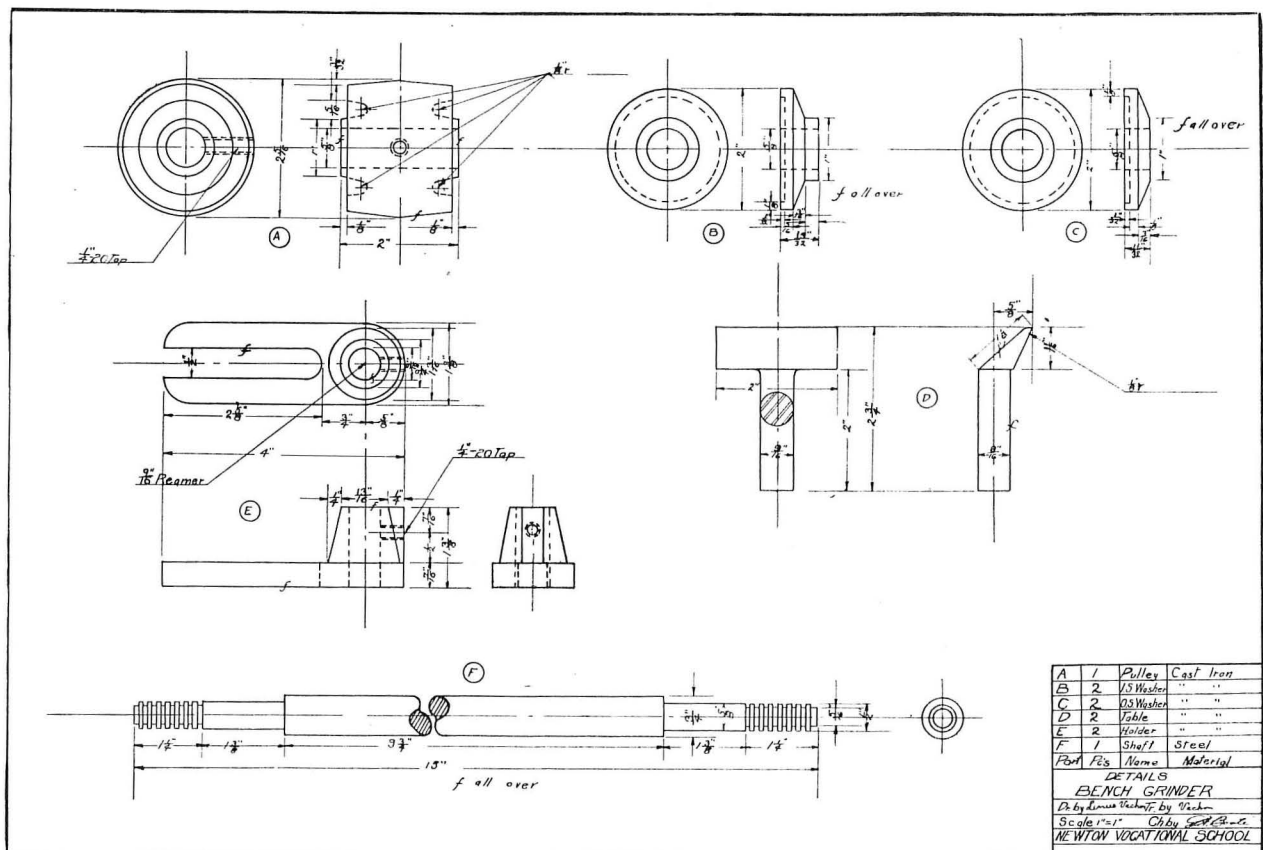
The pattern-making on the base, base caps, table, table holder and pulley is clean cut work in which the boy will take great interest, as it affords a variety of experience.

The design could be improved by chambering the shaft supports for babbitt or some form of anti-

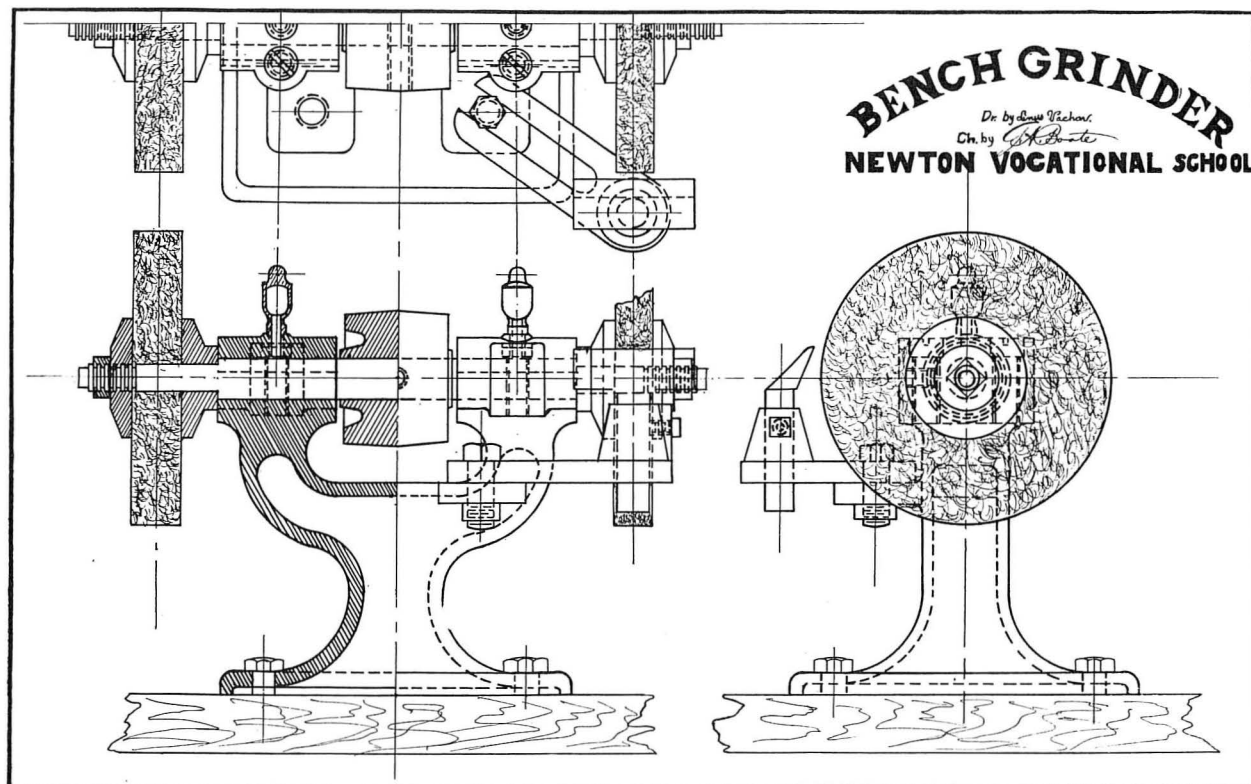
friction metal, since the shaft must revolve at quite a high speed, about 600 r. p. m.

The machining of the parts requires little equipment or skill. The pieces A, B, C, E, are drilled and reamed, then mounted on arbors and finished as per drawings on the engine lathe. The parts D and E are centered and turned on lathe centers, using face plate and dog. The threads on part F should be left handed square threads of about 12 pitch. Two hexagonal head nuts should also be drilled and tapped to fit the threaded parts of the shaft. The shaft should also be finished by taking a very fine chip with a round-nosed tool, then ground or smoothed with fine emery cloth and oil. The base and base caps are finished on the planer or shaper to the dimensions on the drawing.

In assembling, care must be exercised in lining up



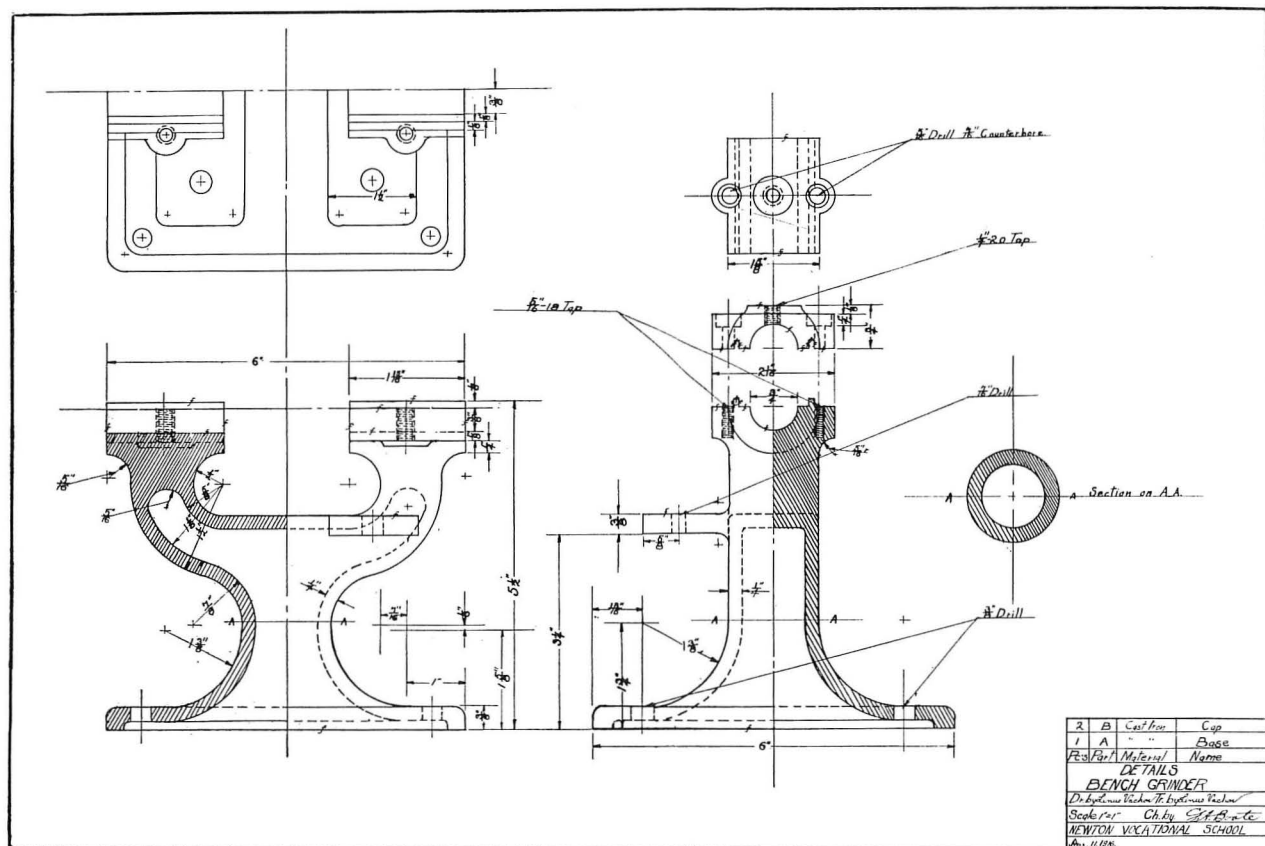
DETAILS OF PARTS FOR BENCH GRINDER.



the shaft to see that it runs freely without side or end play. Oil channels should be chipped in the shaft bearings and caps. The channel to the oil cups must be clear.

The selection of an abrasive wheel will depend

entirely on the nature of work for which the grinder is to be used. On one end may be mounted a buffing wheel and on the other a scratch brush for polishing purposes. The machine may also be used in the machine or woodworking shops.



### DETAILS OF BENCH GRINDER.

# INDUSTRIAL-ARTS MAGAZINE

## Board of Editors

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## EDITORIAL

### CO-OPERATION IN WAR WORK.

THE manual training and vocational teachers have an unusual opportunity now for co-operation in a most important way with other school activities. Great emphasis is now being laid by the government upon farming, gardening, and food production and conservation. Each activity finds its motive and its justification in the emergencies that have arisen out of the war.

No teacher of any line of the industrial arts should hesitate a moment in throwing himself and his classes with all possible dispatch and vigor into the midst of these agricultural, gardening and food production and conservation problems. Many of the problems cannot be satisfactorily solved without the co-operation of the shop. Let the shop teachers and classes make themselves absolutely indispensable to this work.

It is time now to throw away fine-spun distinctions as to courses, duties, privileges, etc., and to think of the overwhelming needs of the hour and the part each can play in meeting those needs.

It seems almost criminal for a school simply to go on in its accustomed serenity, unaffected in courses, methods and activities by the world crisis into which this country has been swept.

The shop teachers must make every possible exertion to facilitate and increase production, to help in every movement for conservation, and to energize by every means at their command, agencies for the subordination of all interests to a common purpose, and for the unification of all endeavors in one common endeavor for the welfare and safety of our common country.

### WHAT SHALL WE DO FOR VACATION?

NOW is the time when teachers are deciding what to do with their summer vacations. Many, of course, will attend summer schools, which action is certainly commendable. Some will plan outings and pleasure trips, while others will engage in gainful occupations.

The term "vacation" should acquire a new significance by the close of this summer. If there was ever a time when teachers, along with other people, needed to plan judiciously and use wisely the summer months, that time certainly is now. Our boys "over there" are probably not planning outings, pleasure trips and other diversions with which to occupy their summer months.

To meet some of the present needs, we know of no course equal in wisdom and importance to that of engaging in some line of production, or commercial trade work. The need for workers in the trades is very great and the remuneration is good. Besides this, by spending the summer in the actual productive work of a commercial shop, one would materially strengthen his preparation for vocational work in the schools later.

This plan has a number of strong points in its favor. It would give a certain recreation due to change of environment and occupation, which is the civilized man's method of resting. He doesn't quit work. He *changes* work. It would bring in substantial returns to help pay for those Liberty Bonds bought on the "bank plan." It would be a patriotic service from another point of view, namely, increased production. And it would fit one for better vocational work.

If there are cases, as there undoubtedly are, where teachers need a period of *complete* relaxation and rest, these, of course, are necessary exceptions to the rule which we are pressing.

The keynote now of every loyal person's desire is *national service*. We do not know of a greater service that could be rendered by teachers during the summer than the service here indicated of helping to keep our people, as individuals and as a nation, economically safe and sound and up to the full demands of emergency production.

### SCHOOL EFFICIENCY AND EXHIBITS.

WE have recently had something to do with an exhibition of various efforts in the name of manual arts from thirty schools of a western commonwealth. Our duty consisted of reviewing these exhibits and offering suggestions for improvement in the work.

Exhibitions of school work indicate the purpose or lack of purpose in the mind of the teacher who gives the instruction. This is their most valuable indication. It may be assumed that the best work produced by a school is put on exhibition, yet the best work of the thirty schools we reviewed did not indicate the most purposeful instruction.

Some of these exhibits showed work in the successive grades of uniform kind and quality. If the labels had been removed from some of these school exhibits it would have been difficult to tell whether the work belonged to the second or the eighth grade. The high school work was often pretentious and pictorial.

Rather poor copies of popular cartoons and illustrations were shown as *high school art* with the names of the ambitious delineators printed boldly at the bottom.

"There must be some young Raphaels among the boys of these schools" commented an innocent old gentleman who did not know the ways and wiles of our American art teacher in preparing an exhibition. We wondered what Raphael might have thought



about it. We wonder if our art teacher would allow a boy to put his name at the bottom of a verse copied from one of the popular writers and exhibit it as a school product. Then we found one but it was done as an exercise in printing.

The manual training was not all above suspicion. Many of the designs had a familiar look. Several book ends of identical pattern suggested that they could not all be original. The teacher later confided in us that he was a *born mechanic* and divided his time between manual training and odd jobs.

Mechanical drawing! Ah! Surely that is systematized and standardized to a pedagogue's fancy.

It was so in one school exhibit. Vertical lines; horizontal lines; dotted lines of various significant sorts; angles of great variety secured with the triangles held so and so; revolutions; projections; geometrical problems with wonderful intersections; lettering that was made with a ruling pen; but not a single, simple, mechanical application in any of these fine instrumental and geometrical operations.

The other extreme was reached in one high school where the entire exhibit consisted of copies from some mysterious mechanical plates that were beyond our interpretation. We suspected that they were of submarine origin and felt a little nervous for fear a federal detective might arrest us for inspecting them. All in the name of manual arts in our American schools.

#### SCALE.

WE have recently visited collections of posters designed to present certain definite ideas on Food Conservation and Production. A few of these posters were beautiful and effective. Some of the pleasing ones were not effective. Some of the effective ones were not pleasing. Many were neither pleasing nor effective, but *useless*. The purpose of these posters was not to please but to instruct.

We have no objection to pleasant instruction but we have criticism of pleasantries without a message when the *purpose was to present a message*. A poster without a message is wasteful. If art instruction is to be maintained in our schools it must be logical and produce logical results. The useless posters were useless because important parts of them were out of *scale*.

A picture was devised that had some bearing on the announcement. It was drawn as a picture, only to find that the announcement had lost force in the mind of the designer and there was no suitable space for the lettering. But the lettering could not be omitted so it was of necessity reduced to *available space* and *printed obscurely*. *Scale* in a design demands that *detail* and the *general scheme* be legible at the *same appropriate distance*. There is no more absolute waste than to devise detail that is not essential to the whole design. If art teachers would do something for art both in and out of the schools they can do no

better than to make certain that pupils observe this one simple, sensible rule.

We recently noted a series of plaster casts of panels representing various methods of transportation. They were well executed. Transportation by sea, land, and air were symbolized in these panels by a modeler of skill who had worked from drawings of ingenious design. Curious as to the use of these designs we found on enquiry that they were the models for carving on a building we had passed and repassed for months.

Could it be that we were growing blind to interests that were important to us? The next visit to that building was not delayed and the panels were at last discovered high on the frieze. But alas! we could only see them from the street below as a confused, meaningless jumble of carved stone. They gave no message and had no part in the effect of the building. Little wonder that we had overlooked them. They would never be seen again except by the sparrows who might use them for nesting places. Time, talent, skill, and money had been wasted by a careless designer without a sense of *scale*.

#### HE THOUGHT HE DESIGNED.

A NOTABLE artist visited the school where as a student he first studied the craft in which he has now reached distinction.

As he passed thru the studios where his early efforts were made, he was much interested in some sketches made by the students of his time and was carried back in memory to those confident, care-free school days with his classmates. "Yes!" said he, looking with recognition at the studies; "Charlie *thought he designed that one* and dear old George *thought he designed that*, and here is one *I thought I designed*."

"But! Did you not design it?" was asked.

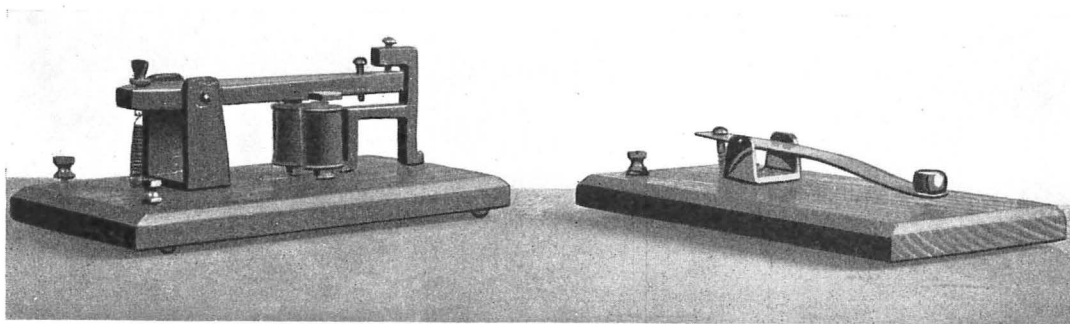
"Design it! Of course not," was the prompt reply. "I only assembled it under the guidance of a skillful teacher who led me to think I was designing. An original design is the expression of original conception. I sometimes wonder if there are any new and original conceptions to be expressed in art. Certainly a school boy or girl cannot have original conceptions of artistic value." Then what is the problem of the art teacher?

"To lead children to think in terms of design by practice in adjusting forms for a definite purpose."

IN this hustling, bustling age, people are too busy to go peering into dark corners on the chance of discovering a case of over-merit. The light that is hidden under a bushel usually stays there and flickers until it goes out.

Over-sensitiveness spells "obscurety," and "obscurety" is but another word for "failure."—*Graham Hood*.

"HE that can have patience can have what he will."—*Franklin*.



## A TELEGRAPH SET FOR AN EIGHTH GRADE

Bernard Baumritter, Shop Instructor, New York City

**I**N these days of modern manual training, when from every quarter is heard the plea for industrialized shop work, for a richer and more varied course of study, the wide-awake teacher is always on the "qui vive" for things to make which will involve not only work in wood, but for things which will carry the boy into more industrial and practical fields. For the ordinary school, with its one woodworking shop representing very often the entire manual training department, such a project will give pupils a good opportunity to acquaint themselves with other lines of work.

In making a telegraph set, the boy becomes familiar with ordinary simple electric wiring, electro-magnetism, drilling and tapping in metal, metal working, casting, soldering, as well as the woodworking and wood finishing processes involved in making the base. When studying the electro-magnet, the boys, as part of their home study, find out and report on such things as the electric bell, telephone, wireless, wireless telephone, dynamo, motor, street car operation, etc. When casting the standards, the simple processes of casting are discussed and some of the more simple things cast from patterns already in hand. Many new tools are involved and new fields of interest are opened up to the boys.

### Making the Sounder.

The patterns for the standards are made by the teacher and passed around the class. A simple flask

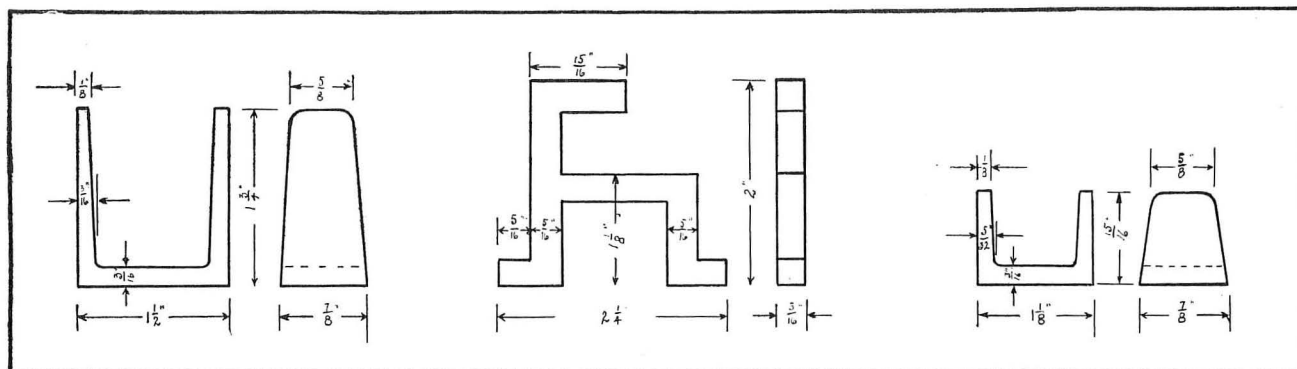
can be made of wood, as shown in the cut, and regular moulding sand can be purchased for a few cents. While lead will do, solder is preferable. The casting is done in the regular way, with cope, drag, sprue pin, gate, vent holes, etc. The coils can be gotten from any buzzer or old bell. For binding posts, the boys may use the binding posts of discarded dry cells. The spring in the sounder is made by each boy from spring wire, wound around a  $\frac{1}{8}$ " rod. The spring for the sounder needs careful attention. A hole is carefully bored in the screw, shown at H, and one end goes thru this, while the other end is held loosely by the small round-headed screw in such a way that when an adjustment is desired, the entire spring revolves with the top screw, only it becomes shorter or longer, in accordance with the raising or lowering of the adjusting screw.

In the absence of a tap, the machine screw used in the adjustment of the click in the sounder may be used to make the thread in the anvil.

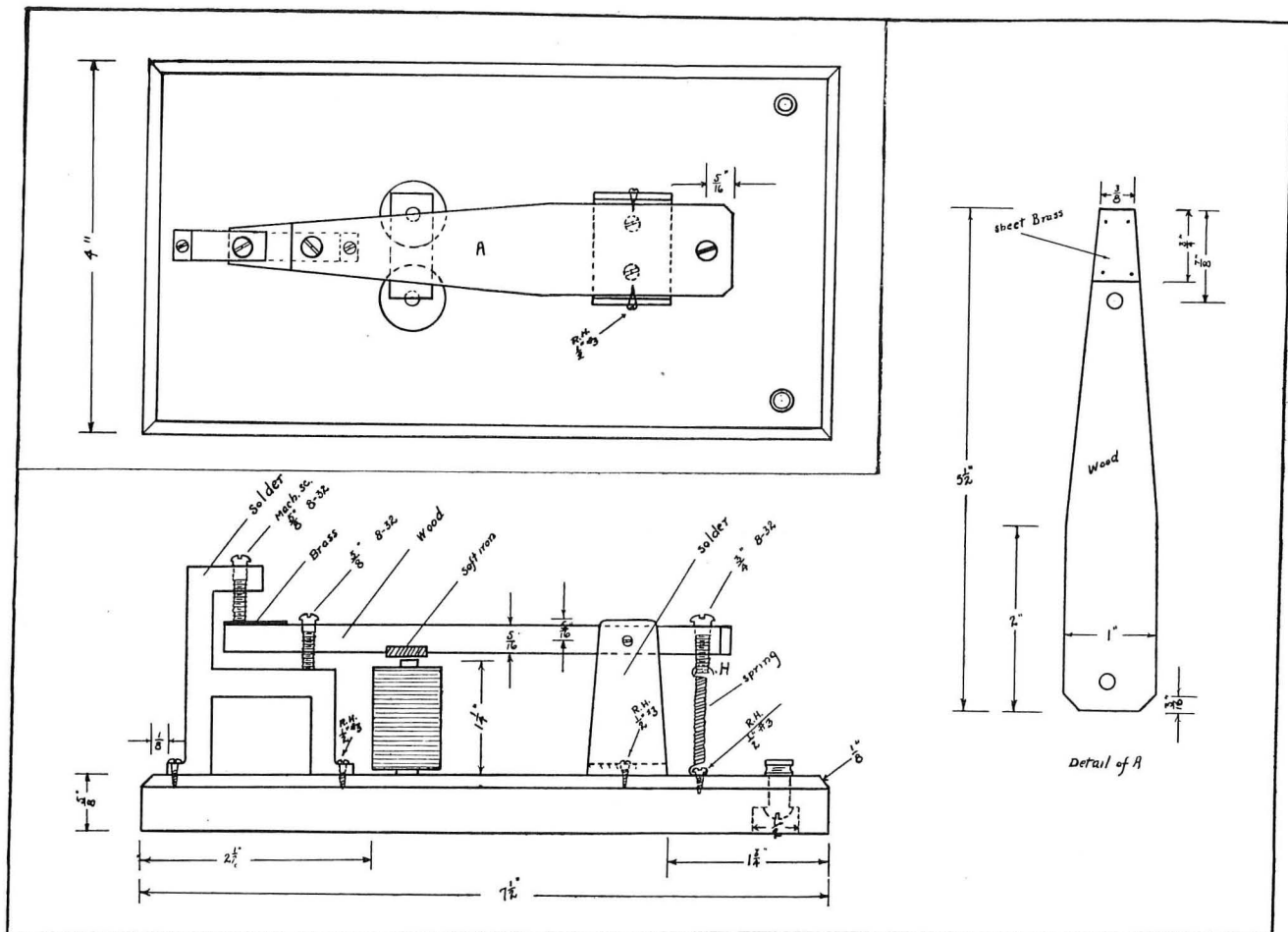
Venetian iron, if available, is a very good substitute for the soft iron for the armature.

### Making the Key.

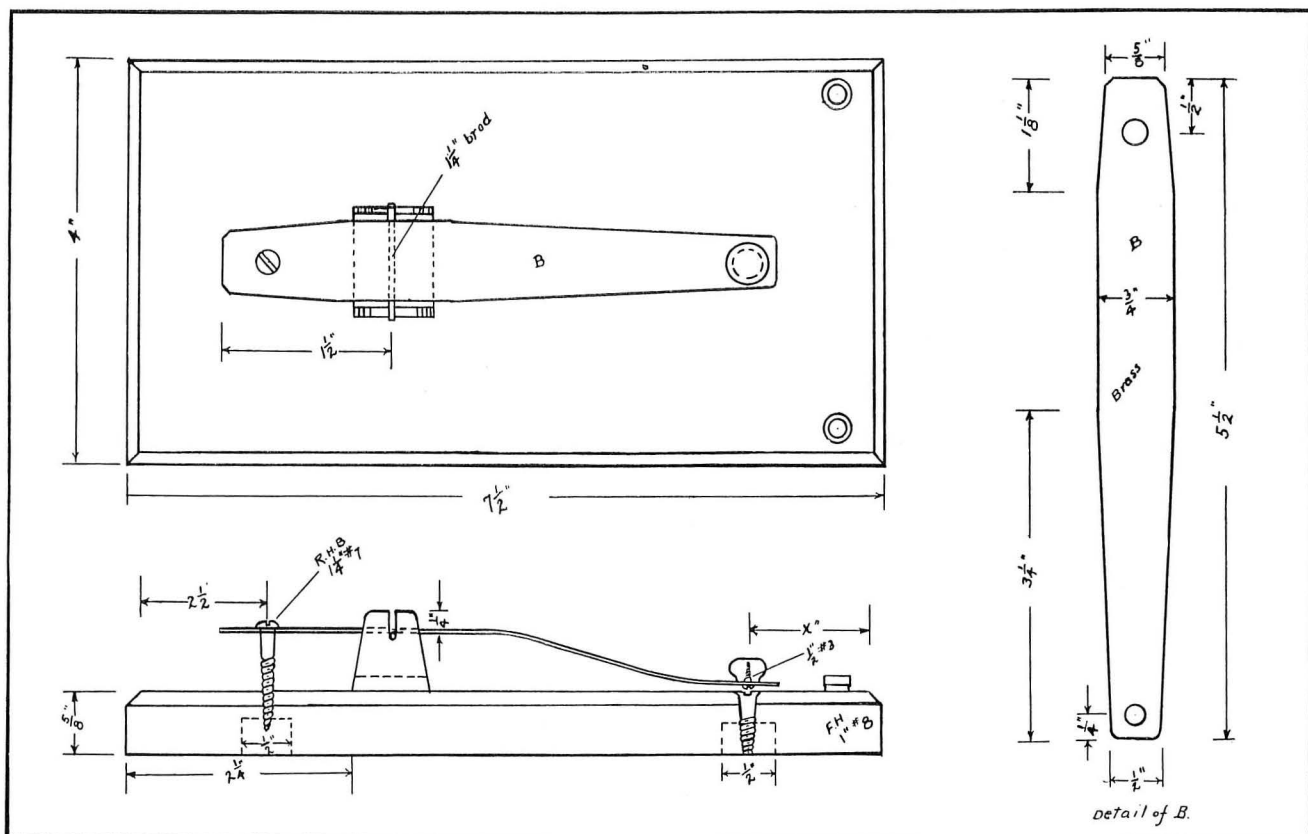
In making the key, where brass is not available, heavy galvanized zinc may be substituted. The brass is bent as shown in drawing, and the stroke is adjustable by means of the screw. A  $1\frac{1}{4}$ " brad with the head filed off is soldered on to the brass, to act as a pivot. A hack saw, with two blades in the frame, is used to make the saw cuts in the standard.



DETAILS OF WOOD PATTERNS USED FOR THE CASTINGS OF A TELEGRAPH SET.



DETAILS OF RECEIVING INSTRUMENT.



DETAILS OF SENDING INSTRUMENT.

The knob is the head of an ordinary clothes pin. For the faster workers a switch may be added to the key.

A proper finish will greatly enhance the appear-

ance of the set. If brass is used it should be given a bright finish. The castings are painted black and the coils colored green. The base is stained mahogany and is varnished.

## A FEW KINKS IN SCHOOL WAR SERVICE

Shortly after the declaration of war in 1917, a Red Cross official in Washington expressed to a Massachusetts superintendent some surprise and much appreciation of the willingness of the schools to respond to the call for service. There were then, as there now are, more requests for permission to volunteer school service than the different relief,—as well as military,—authorities could use. Like the Red Cross official, the opinion of all federal administrative authorities who have come in contact with the schools, has risen unexpectedly high. These authorities have discovered in the schools for the first time a vast force that renders service in its own way and according to its ability, as generously and as unselfishly as ever a volunteer who goes to the battle front in France.

Below are a few "kinks" in war service that have come from subscribers to the editors of the Magazine.

The art students of the Oswego State Normal School, Oswego, N. Y., have found a practical war use for their art ability in preparing officers' trunks for service overseas. They have painted names and the well known star-circle insignia on trunk tops. A heavy enamel paint has been found most satisfactory.

The high schools of Boston and vicinity made two hundred game tables for use in naval cantonments and recreation centers. In the illustration are shown a few of the official type of table made by the Freshmen Class of the



Game Tables Made in Lynn, Mass., High School.

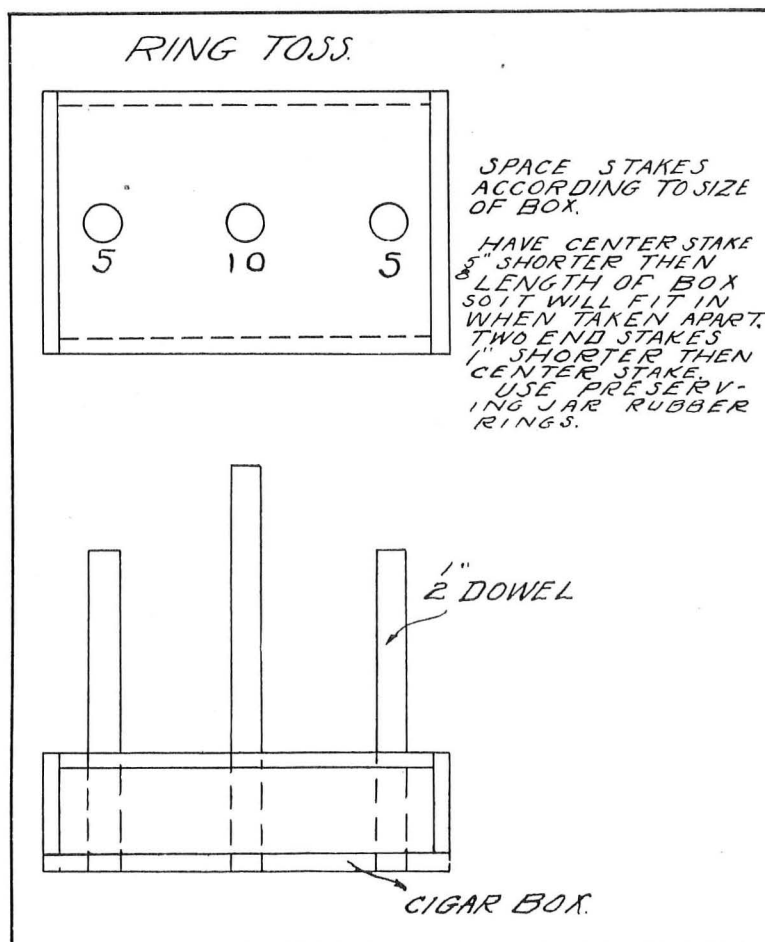
boards, colored magazine covers, etc. A commercial standard of design and finish was insisted upon and strictly educational



A Suggestion for Art Classes. Painting the Name and Insignia on Army Trunks.

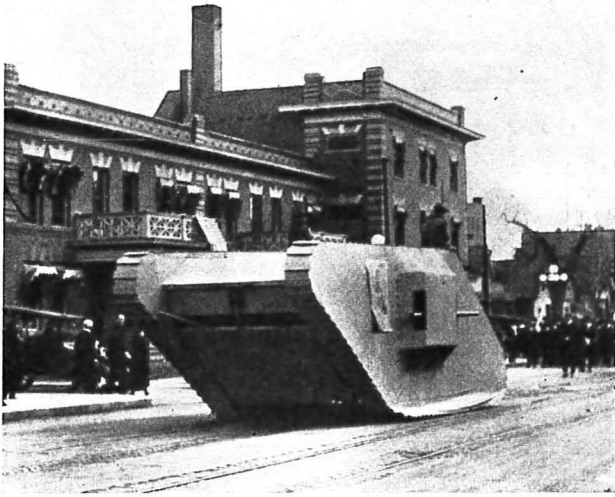
English High School, Lynn, Mass., under the direction of Mr. Charles Rodgers, instructor in manual training. It will be noticed that the tables are heavier and more substantial than the army tables shown in the May Magazine. The permission to make the tables was obtained by the War Committee of the Boston Manual Training Club.

A Christmas sale was organized by the Lincoln Junior High School, Duluth, for the benefit of the Red Cross. It was stipulated by the instructor, Mr. H. G. Schumacher, that all articles to be disposed of at the sale should be made by the boys and that war economy should be practiced in the use of materials. The toys, puzzles and small articles of home furniture were accordingly made from waste materials such as cigar box stock, packing case



DETAILS OF RING TOSS.  
Made by Students of H. G. Schumacher, Duluth, Minn.





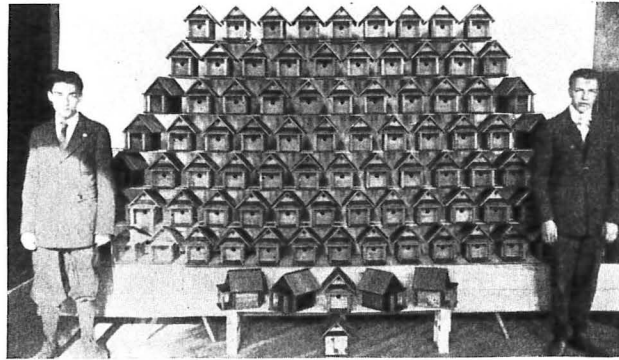
A War Tank Float in Operation.

methods were followed in presenting and working out the projects in the shop. The results were a neat sum realized for the Red Cross, a splendid exhibit, a goodly amount of toys that pleased children and parents, and a most interesting month's work in the school shop.

The accompanying sketch and photographs show a war-tank float similar to those used on the western front which was built by students in the industrial department of the Centennial High School, Pueblo, Colo. It was used in a parade during the Third Liberty Loan campaign and was one of the biggest features of the demonstration, bringing many applauses from the crowd. The design was made and the construction was supervised by Mr. H. A. Tiemann, instructor.

The drawing gives an idea of the construction and as it is a problem in rough carpentry these may be varied to fit

convenient supplies and conditions. The wood framework was covered with heavy drill; roofing disks were used to give the appearance of rivets used on armor plate of the real tanks. Pieces of wood 1"x4", spaced 4" apart, were nailed on over canvas on treads to give the appearance of the caterpillar tread. The guns were made of wood and painted black, while the whole was painted battleship gray. A one-ton auto truck furnished the motive power. All materials were furnished by patriotic businessmen of the city. It was manned by Boy Scouts in full uniform and on the whole presented a very realistic appearance.

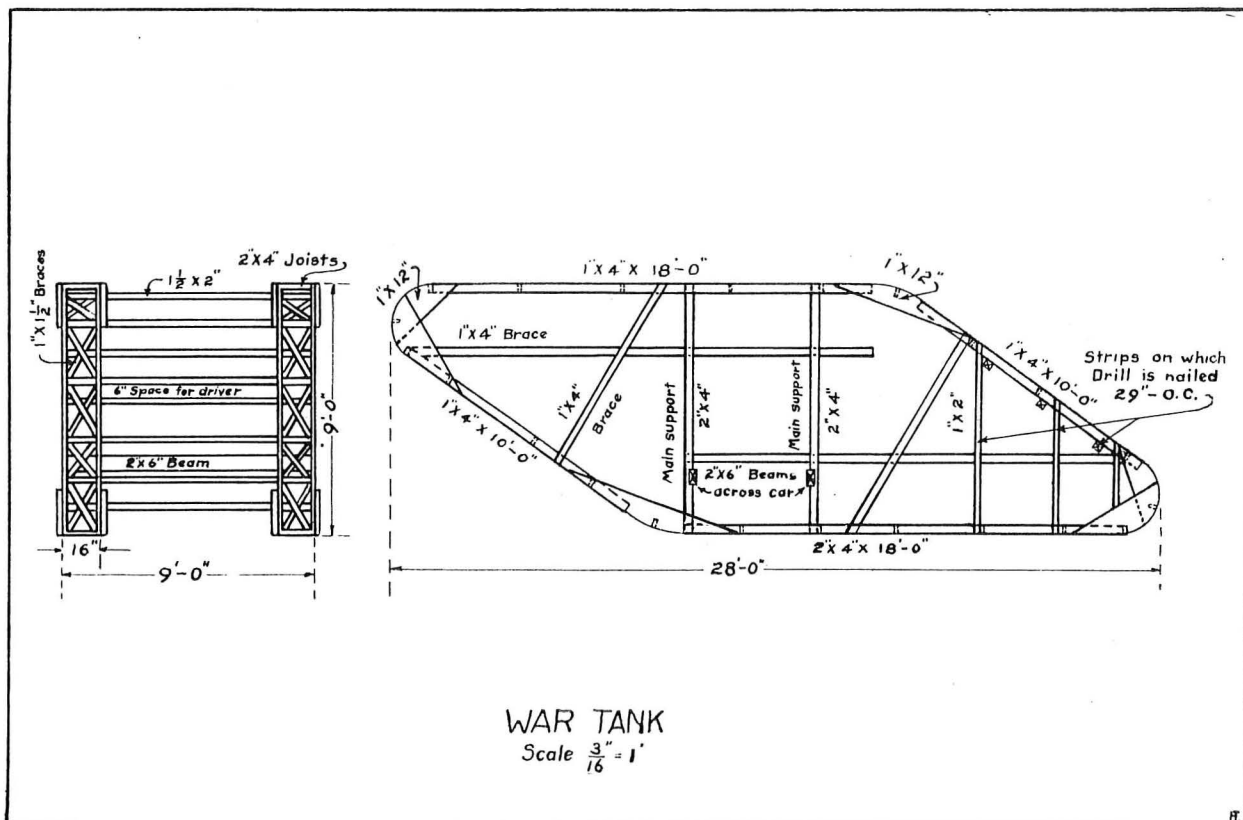


Birdhouses made in Saginaw Mich.

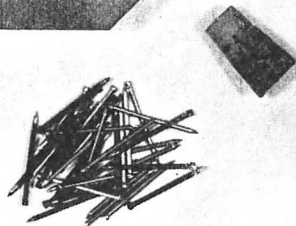
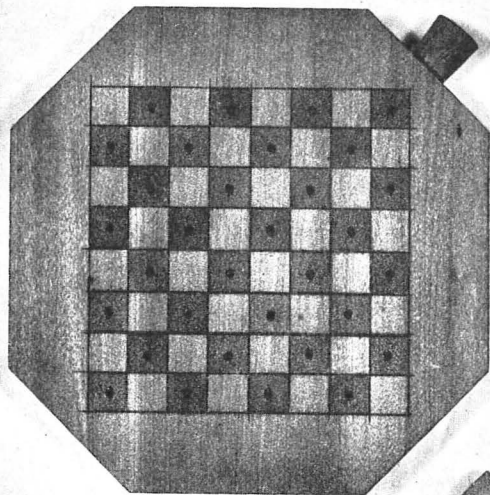
Centennial High School is doing not only her bit but her best to help the United States to a speedy victory, having turned over the entire industrial department to Red Cross, Y. M. C. A., and other war work.

Birdhouses were the source of revenue for carrying on some war activities at Saginaw, Mich. Under the direction of Mr. Wm. J. Craig, the boys made a large number of wren houses and other birdhouses and sold them thruout the community. The projects were worked out on a factory basis.

The boys in the same classes also made a large number of checker and Red Cross solitaire boards for local selectmen.



DETAILS OF WAR TANK FLOAT.

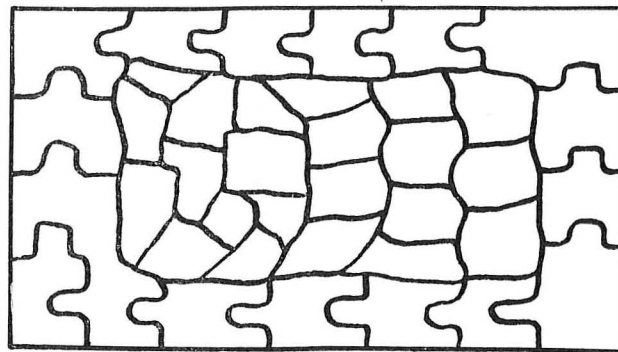


Checker and Solitaire Board made by Students of Wm. J. Craig,  
Saginaw, Mich.

The boards were made of  $\frac{3}{4}$ " hardwood, about  $4\frac{1}{2}$ " square. The boards were planed, cut into octagonal shape, scored, drilled, and stained for the games and given a coat of wax. Holes were bored in two sides to hold the checkermen which, in this case, consisted of small brads dipped in red or blue paint. Corks were provided to hold the nails in the receptacles.

To facilitate the cutting of checkermen in a small shop where no machinery was available, Mr. P. E. Kline, of Winnetka, Ill., has devised a useful jig. It is made of hardwood and is attached to an ordinary bench. A small brad driven at right angles into the end of each broom handle, provides means for moving the handle forward so that the checkermen are sawed true and of equal thickness. An empty chalk box receives the checkers as cut.

Mr. Frank C. Vincent, supervisor of "household furnishings" for the Northwestern Division of the Red Cross, has prepared directions and drawings for a knitting needle, a sock stretcher, three puzzles, a game table and a checker board to be made for Red Cross hospitals and army cantonments. The material is available to schoolmen in the form of a special issue of "The Exchange" issued gratis by the Washington State Normal School, Bellingham, Wash.



Typical Jig Saw Puzzle made in Saginaw, Mich., for School War Chest.

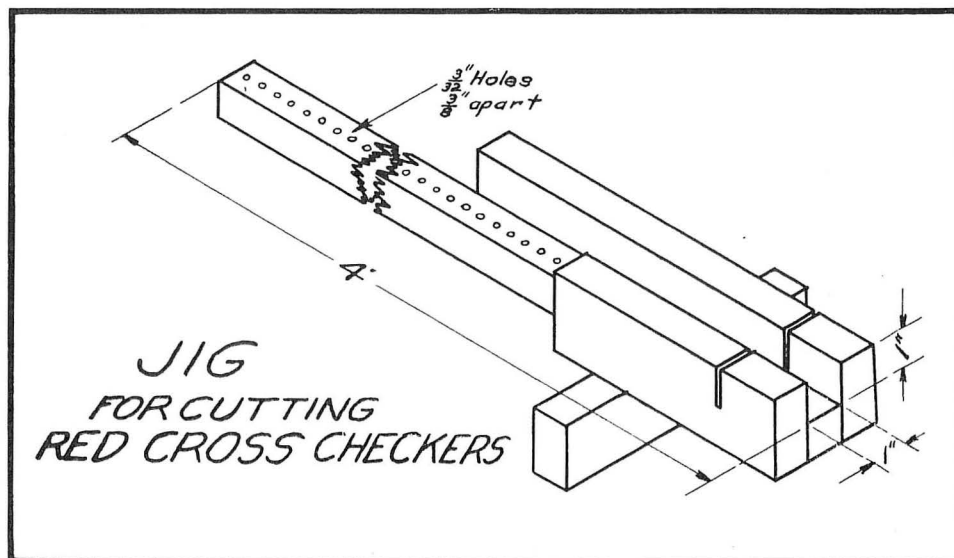
#### INDUSTRIAL ARTS ROUND TABLE.

On May the fourth, the Chicago Industrial Arts Round Table Club went on an excursion to Mooseheart, 35 miles west of Chicago. Mooseheart is a little wonder city all by itself, where a great industrial home has been built by the Loyal Order of Moose to provide for children of deceased members of the fraternity.

The estate consists of more than one thousand acres of land situated along the bank of the Fox River. The children live in houses built on the estate, a unit of about twelve children living in each house, in charge of a proctor or matron. By living in small groups it is much easier to preserve the home atmosphere so essential to the proper rearing of young children. The visitor on entering Mooseheart is first impressed by the absence of the uniformity and spirit of morbidness so often found in homes for dependents. On the contrary the joy and good cheer of home life seems to be just as active here as in the best regulated family home, with laughing, playing children, beautiful scenery, and where the boys and girls learn the practical side of life. The entire institution is under the direct management of Superintendent Adams, who, thru his close study of human nature and with his pleasing personality, seems a real father to every one of the nearly five hundred boys and girls enrolled in the home. From the youngest babe in the nursery to the oldest boy or girl, the close relationship and personal touch as of father to child is a prevailing feature of the home, and adds to the comfortable atmosphere of the entire institution.

This close comradeship between official and students finds its reaction in the larger boys, who assume the attitude of "big brother" to the smaller boys.

The round table club appreciated very much the interest and courtesy shown them by Mr. Adams, who personally conducted the party about the big estate and explained the aims and plans for the operation of the big school, answering many questions, all of which gave the club a most pleasant and profitable day.



JIG DESIGNED BY MR. P. E. KLINE, WINNETKA, ILL.

# PROBLEMS AND PROJECTS

The Department of Problems and Projects, which is a regular feature of the *INDUSTRIAL-ARTS MAGAZINE*, aims to present each month a wide variety of class and shop projects in the Industrial Arts.

Readers are invited to submit successful problems and projects. A brief description of constructed problems, not exceeding 250 words in length, should be accompanied by a good working drawing and a good photograph. The originals of the problems in drawing, design, etc., should be sent.

Problems in benchwork, machine shop practice, turning, patternmaking, sewing, millinery, forging, cooking, jewelry, bookbinding, basketry, pottery, leather work, cement work, foundry work, and other lines of industrial-arts work are desired for consideration.

Drawings and manuscripts should be addressed: The Editors, *INDUSTRIAL-ARTS MAGAZINE*, Milwaukee, Wis.

## A KINDERGARTEN SEE-SAW.

G. Gillen, Instructor in Manual Training,  
Brooklyn, N. Y.

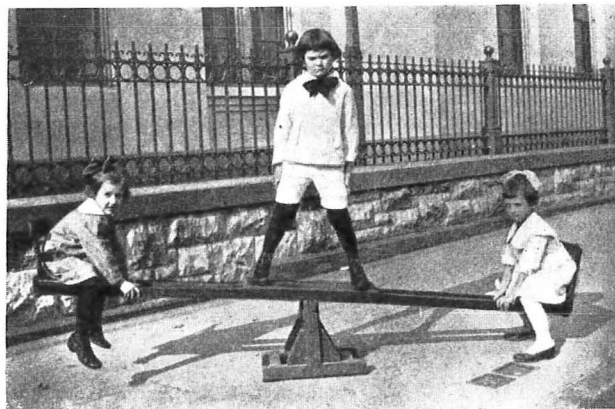
This see-saw was constructed by the boys of the eighth grade in the workshop of Elementary School No. 85, Brooklyn. Two discarded kindergarten chairs were used. These are fastened with screws to the balancing frame.

The rubber-tipped crutch ends of the chairs are used to eliminate noise. These are cut off to  $\frac{3}{4}$ " and fastened with screws to the balancing frame and the floor pieces.

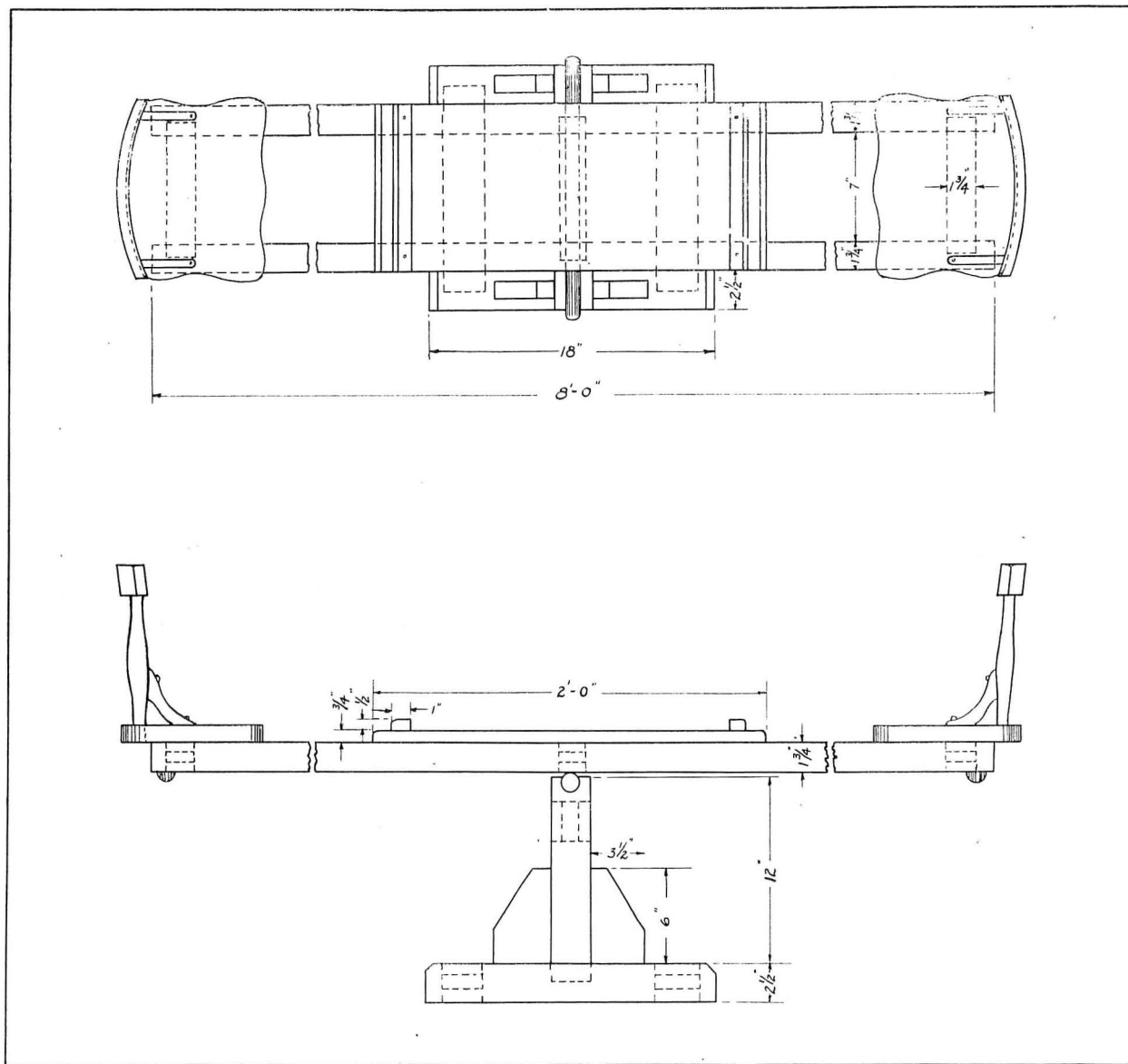
A piece of broom handle is screwed on the center of the bottom side of the balance frame to act as the pivot. The balance board and the cleats are screwed to the upper side of the balance frame.

Mortise and tenon joints are used in the construction. These are glued and pinned.

The see-saw is stained and varnished to harmonize with kindergarten furniture.



A Kindergarten See-Saw.



DETAILS OF KINDERGARTEN SEE-SAW.

*Bill of Material.*

- 2 kindergarten chair seats with backs.
- 8 rubber crutch ends (silencers).
- 1 piece broom handle 18" long, pivot.
- 2 pieces chestnut  $1\frac{3}{4}'' \times 1\frac{3}{4}'' \times 8' 0''$ , balance.
- 3 pieces chestnut  $1\frac{3}{4}'' \times 1\frac{3}{4}'' \times 0' 9''$ , frame.
- 2 pieces  $2\frac{1}{2}'' \times 2\frac{1}{2}'' \times 1' 6''$ , floor pieces.
- 2 pieces  $2\frac{1}{2}'' \times 2\frac{1}{2}'' \times 1' 1''$ , uprights.
- 3 pieces chestnut  $2\frac{1}{2}'' \times 2\frac{1}{2}'' \times 1' 1''$ , rails.
- 4 pieces chestnut  $1\frac{1}{2}'' \times 3\frac{1}{2}'' \times 0' 6''$ , brackets.
- 1 piece  $\frac{3}{4}'' \times 10\frac{1}{2}'' \times 2' 0''$ , balance board.
- 2 pieces chestnut  $\frac{1}{2}'' \times 1' \times 0' 10\frac{1}{2}''$ , cleats.

**A WAR-TIME GAME.**

C. S. Goldsmith, Supervisor of Industrial Arts,  
Carlstadt and Oradell, N. J.

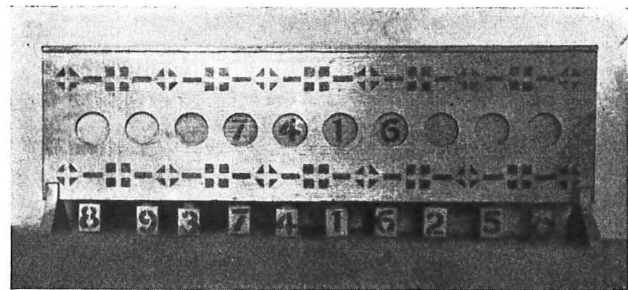
During these days of strict conservation, the large project has no place in elementary shop work. Realizing this, I have worked out a project which furnishes a maximum of construction with a minimum of material; indeed, the project here shown taxes the scrap-pile to its limit.

Aside from its economical aspect, the war-time game is both amusing and useful. It will help divert the mind of the convalescent soldier in the hospital, and will keep the young folks out of mischief in the home.

Made with ten holes instead of five, it aids considerably in the schoolroom to give a sense of reality to number lessons. It will supplement ring-toss, bean-bags, and similar games in which counting and keeping score predominate.

As a seventh or eighth-grade problem, on the division of labor basis, a number of games may be constructed in a comparatively short time. Jigs should be made to facilitate boring the holes in the lugs and in the arms.

The feet are so laid out that the top of one forms the



The Completed Game.

bottom of the other, and in marking them out the pattern is merely reversed each time.

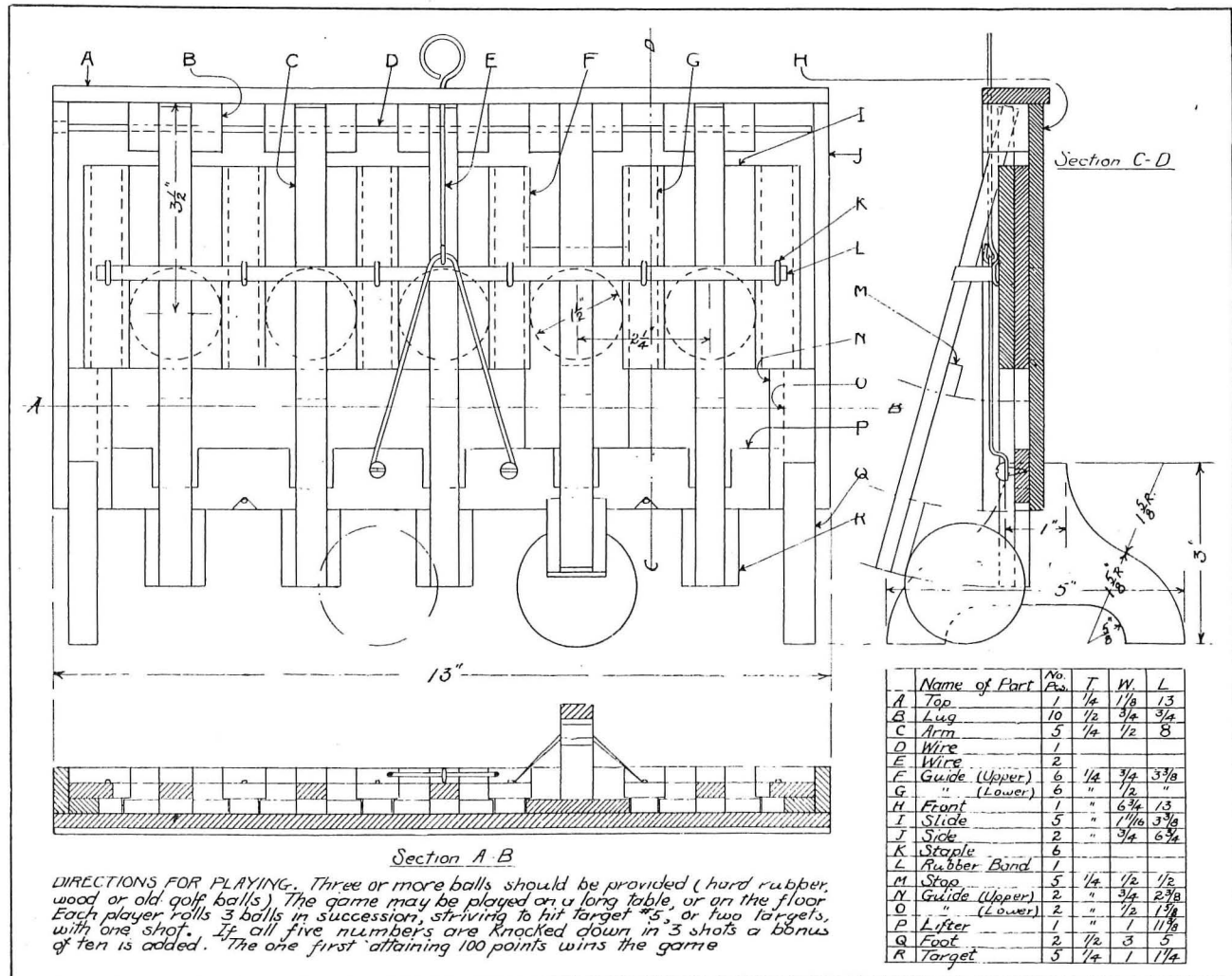
The finished game may be painted and decorated to suit the individual fancy.

A frame of some sort should be provided to retain the balls back of the game when they are rolled at the targets.

**A DOWEL CUTTER FOR THE LATHE.**

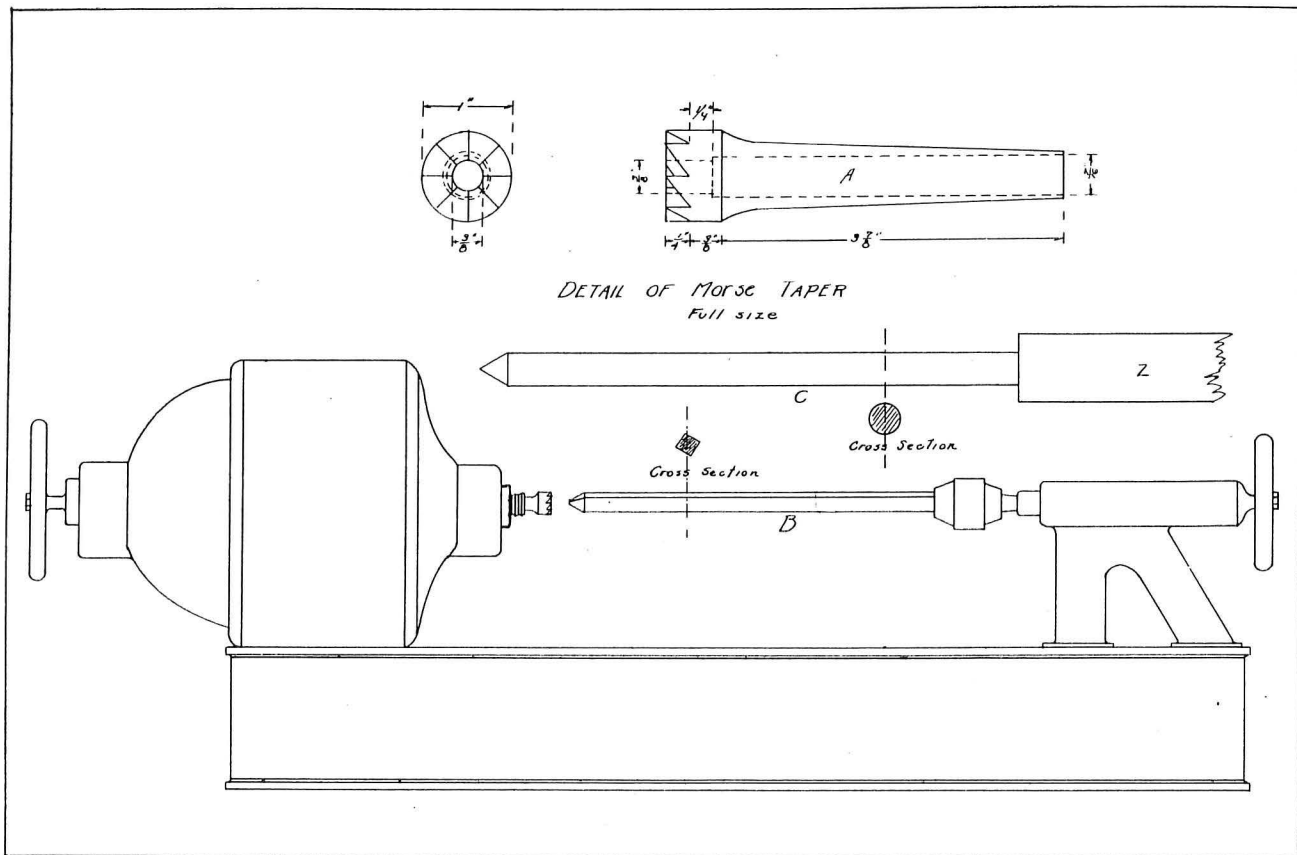
H. F. Rusch, Oklahoma City, Okla.

The demand for knitting needles was so great in Oklahoma City during the past winter that the merchants could not supply the public. In order to help out in this shortage, the writer asked a woodturning class to bring in suggestions how to make knitting needles quickly and efficiently. In response to this call, one boy brought in a  $\frac{3}{8}''$  gas pipe on one end of which he had filed a number of teeth. This cutter was fastened into a hollow tailstock and pushed into the stick of wood which was fastened to the live center by means of a chuck. This method was quite successful for a  $\frac{3}{8}''$  dowel but for anything less it was not satisfactory.

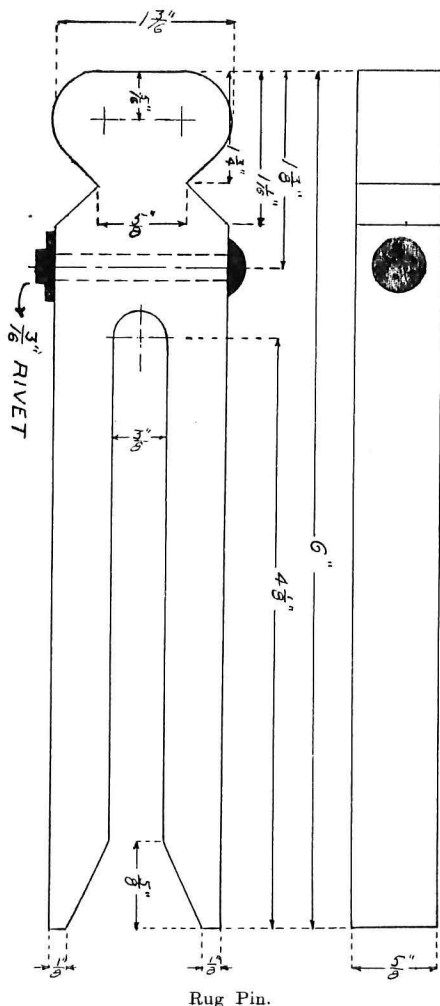


DETAILS OF MARBLE OR BALL ROLLING GAME

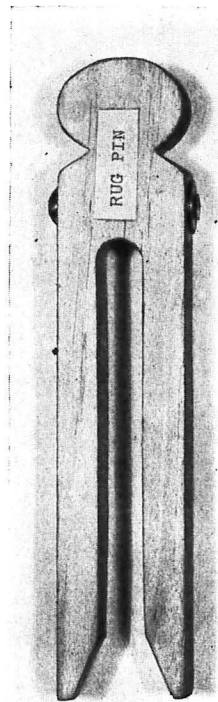




DETAILS OF LATHE DOWEL CUTTER



Rug Pin.



The accompanying illustration shows how any commercial sized dowel may be made.

To make the cutter, take a piece of high carbon steel, anneal in lime, center and countersink, cut taper to fit your lathe, drill hole the required diameter of dowel you wish to cut to a depth of  $\frac{1}{4}$ " on face of blank. Reverse ends and drill a hole  $\frac{1}{16}$ " larger than the dowel desired. Drill until you meet the hole from the face side of the blank. Place blank in milling machine headstock, set headstock 25 degrees beyond 90 degrees, then use a 60-degree right hand single angle milling cutter to cut radial teeth. On cutters for  $\frac{3}{8}$ " and less make 8 teeth, anything above  $\frac{3}{8}$ " make 10 teeth. Harden in oil and temper to a purple.

Fig. A shows a cutter for a  $\frac{3}{8}$ " dowel. This cutter is for a No. 2 Morse taper. The cutting face should be wide enough to clear the cross section of the size stock you wish to cut. The stock to be cut need not have the grain running parallel to the long axis. The stock may be either soft or hard.

Fig. B shows the stock fastened in a chuck and placed in the tailstock of the lathe ready to be shoved into the revolving cutter that has between 2,000 and 3,000 revolutions per minute. The point of the stock is first sharpened with a dowel sharpener to assure the starting of the stock approximately in the center.

Fig. C shows a 3-16" knitting needle ready to have the head put on. Place end Z of Fig. C in a chuck and put into the live center of a lathe; place the point of the needle into a countersunk cupcenter at tailstock, form head, sand paper, sharpen point of needle on a pencil sharpener, shellac and wax.

The length of the dowel is limited to the length of the lathe bed and the diameter is limited to the size of the hollow spindle in the lathe.

This dowel cutter is a great scrap saver. If the school's industrial shops are not equipped to make this cutter any commercial machine shop can make them. There must be a separate cutter for the different sizes.

#### A RUG PIN.

J. I. Sowers, Vincennes, Ind.

The Rug Pin illustrated in the accompanying photograph and drawing possesses a number of advantages. It is reasonable for the middle of the second semester and is

well adapted to the abilities of sixth-grade boys who have begun woodwork in September. It involves a considerable number of processes and requires a minimum of material. It interests boys because of its utility in holding rugs on the line while they are being pounded and brushed.

#### A RED CROSS FOLDING BOARD.

Fred Short, St. Croix Falls, Wis.

The accompanying drawings show a board which is used by Red Cross workers for testing the size of folded material. The work to be folded is turned to the desired shape and then placed upon this board, which may be placed on the table at the worker's side. This saves measuring both ways with a ruler or yardstick and also gives the worker a good idea of the size to which the material is to be folded. The size to which the material is to be folded (as noted on the drawings to be  $10\frac{3}{4}'' \times 12''$ ) is established at the Red Cross Division Headquarters. This secures uniformity and facilitates pack-

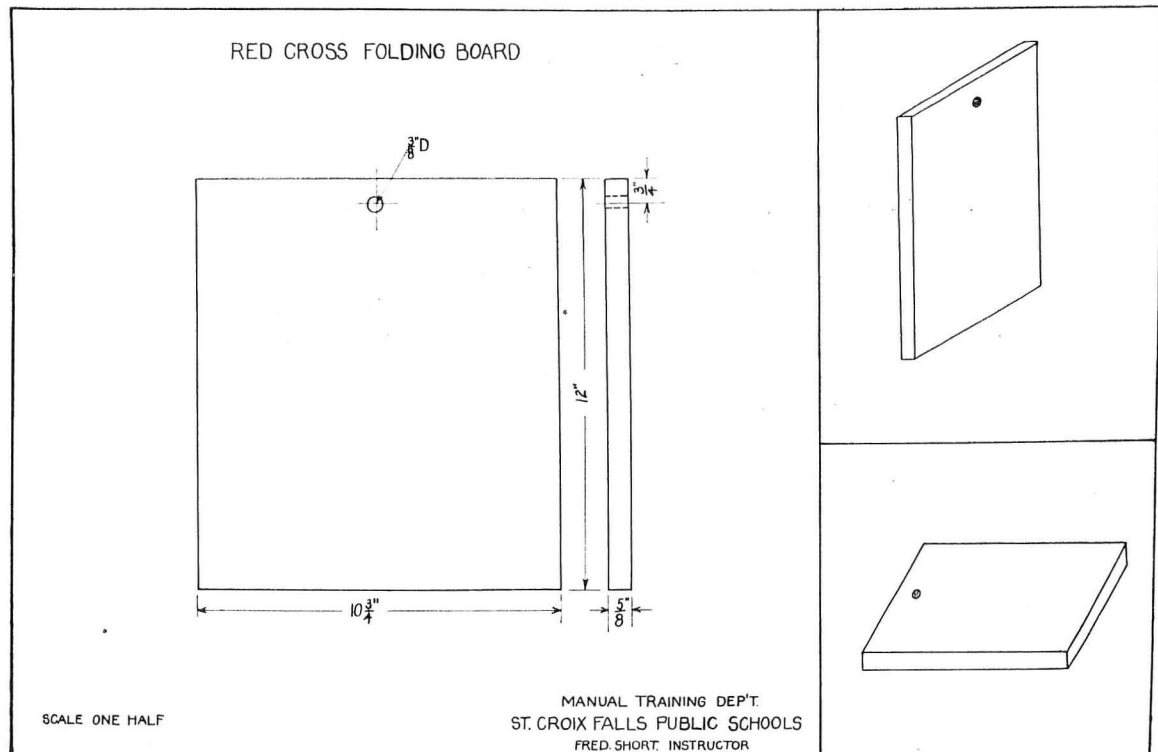
materials may be stored in it without any fear of damage to property if a fire is started inside the cabinet from spontaneous combustion or other causes. A fire of this sort would simply burn itself out.

It makes an excellent problem for a prevocational sheet-metal class, there being seventeen different operations in the making.

The prices given in the cost column on the material specification sheet were current market quotations for June, 1914.

#### Material Specifications for Paint and Oil Cabinet.

No. Req.	Name of Part	Kind of Material	Cost
1	Back and sides	No. 26 Galv. iron	\$.30
1	Top	No. 26 Galv. iron	.06
1	Bottom	No. 22 Galv. iron	.08
1	Door	No. 22 Galv. iron	.21



DETAILS OF RED CROSS FOLDING BOARD

ing, shipping and re-shipping. This problem makes a very good community problem for grade classes in bench woodwork. Any soft wood of the proper thickness may be used. The piece is squared up and cut to size, a hole bored at one end (by means of which the boards can be hung up when not in use) and sandpapered carefully with 0 to 00 sandpaper. Two coats of shellac may be applied and rubbed down, which will keep the boards from becoming soiled by handling and also prevent warping.

#### A PAINT AND OIL CABINET.

Hugh J. Cox, Shop Foreman, Boston Trade School.

The corner of the shop in which staining and finishing is carried on is often the source of annoyance to the teachers who wish to keep things in such condition that effective work may be done.

The cabinet shown in the accompanying drawing solved this problem for the manual training teachers of the Boston schools.

This cabinet is made of galvanized iron, which is iron coated with zinc, and is therefore fire resisting. The shelves are removable, and metal being non-absorbent it is easily kept clean.

The door, when open, may be used as a mixing table and also a staining table for small articles.

When this cabinet is fastened to a brick or concrete wall, alcohol, turpentine, shellac, gasoline, and other inflammable

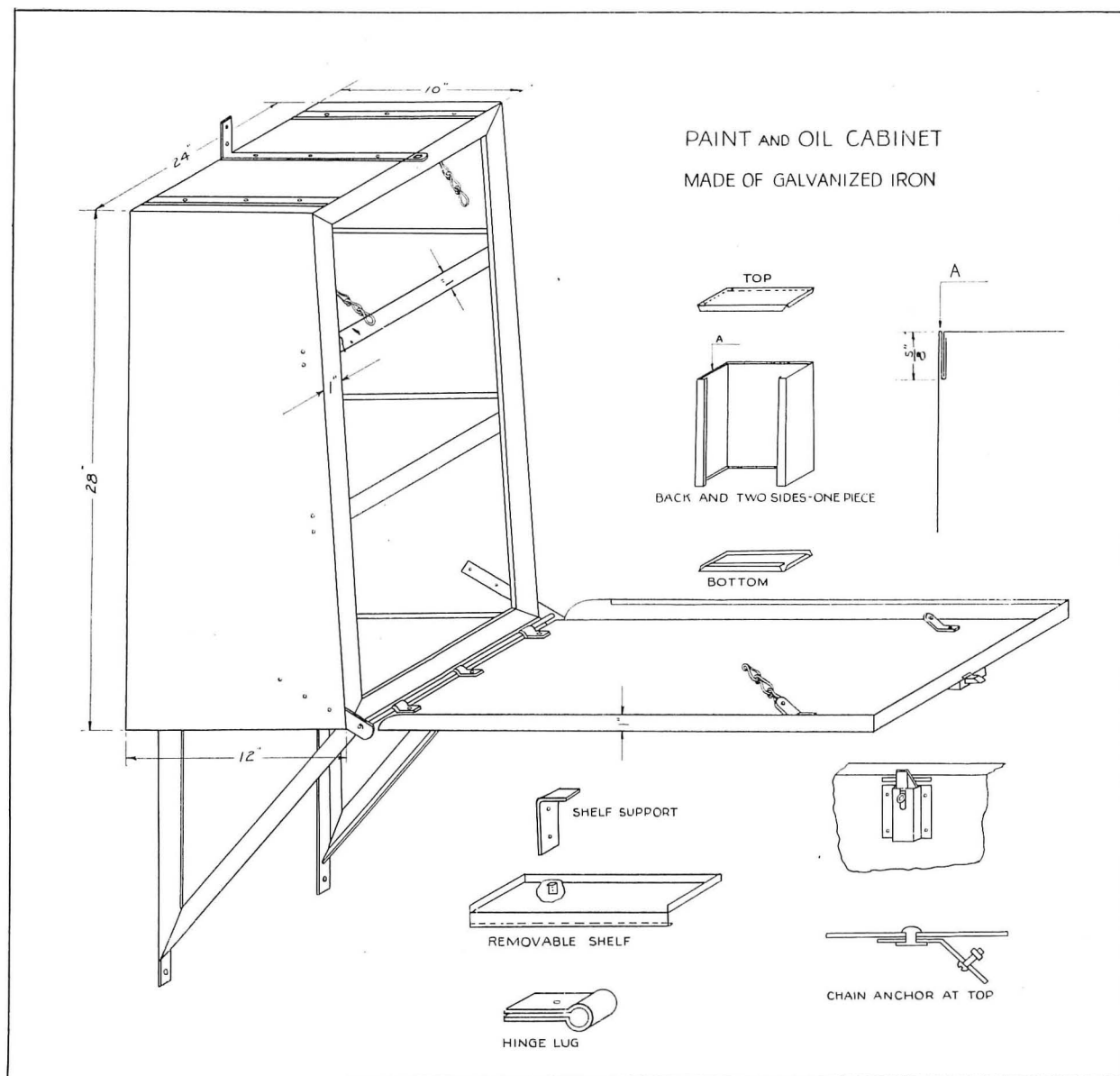
2	Shelves	No. 22 Galv. iron	.17
2	Wall brackets	1''x1''x $\frac{1}{8}$ '' Angle iron	.24
2	Chains	Medium-Sash	.30
1	Cupboard catch	Brass	.30
1	Hinge rod	$\frac{3}{8}$ '' Galvanized	.04
42	Rivets	3 lb.	.12
12	Rivets	12 lb.	.15
6	Expansion bolts	No. 8x1 $\frac{1}{2}$ '' Lead shield	.25
4	Bolts	3-16''x $\frac{3}{4}$ '' Round head	.10
10	Shelf supports	} 1''x $\frac{1}{8}$ '' Band iron galv.	.20
3	Hinges		
4	Chain anchors		
2	Hinge ears		
1	Wall brace	}	.20
	Solder		
	Paint	To match room	.30

Total material \$3.02

#### ELEMENTARY MANUAL TRAINING.

Teachers' Club of Chicago.

The club arranged three trips for the spring vacation, as follows: April 30, a visit to S. Karpen & Sons Furniture Factory, Frank A. Perkins, leader; May 1st, the Pullman Free School of Manual Training and the Pullman Car Shops, A. J. Brinkman, leader; May 3rd, McCormick Harvester Works and Twine Factory, H. J. Barber, leader. The



DETAILS OF PAINT AND OIL CABINET.

number of teachers in each party was from thirty to fifty.

The object of these visits was to enable the teachers to better understand the needs of the pupils they are training, many of whom will soon enter the industrial world, and to gain information of modern factory methods adapted to the limitations of the school shop. The processes of making agricultural machinery were followed from the foundry to the shipping room where the binders, combined harvesters and threshers and many other machines for lightening the labor of the farmers are shipped to all parts of the earth. Both in the harvester works and twine mills the almost human machines for doing the shopwork attracted attention.

Large rooms, filled with complicated machines, were turning out work in huge quantities and needing a small number of attendants. In the twine mills one neatly dressed girl presided over a dozen machines that were turning great bales of Sisal into the balls of twine to bind the wheat and corn. Everywhere the need of careful, intelligent machine operators was demonstrated while the old handwork seemed largely superseded by the automatic machinery.

The furniture factory visited caters to the trade that demands high priced hand made goods, and the wood carver and expert finisher are still in evidence. Automatic machines, rough carving a number of duplicate pieces; air brush machinery that sprayed on the varnish and some other devices reduced the hand labor somewhat but the greater part of the work requires the skill of the master craftsman.

The Pullman shops also use many new machines that have replaced the old slow hand processes and the use of steel cars has reduced the demand for expert workers in wood, once so numerous in the sleeping car department.

The Pullman Free School of Manual Training is a magnificent gift to education made by the will of Geo. M. Pullman, who founded the Pullman Company. The marvelous work of the school, its fine buildings, modern equipment, and the ideals towards which it is working are explained in a booklet that may be obtained by addressing the principal, Dr. Laemas G. Weld, Pullman, Ill.

Not the least of the pleasures of this visit was the excellent luncheon served to the visitors by the domestic science department of the school. These three visits, to places of widely different activities, could not help but make the teachers more efficient.

The monthly meeting of the club was held in the club rooms at the Mallery Building, April 27th. The principal feature was a talk by Mrs. Wm. Schneidewendt, teacher of retarded children in the Walsh School.

Many of her pupils have serious physical and mental defects that have kept them from doing regular grade work. Basket work in many forms, making toys, a great variety of work for the Red Cross and the staging, costuming, and giving of wholesome school plays have developed children who had been considered hopeless.

The large club table was covered with the handwork of

the children for demonstration. The keynote of her talk, and the secret of her success as a teacher, was the sympathy she has always felt for the unfortunate and the practice of never saying to the children, nor allowing others to say, anything to make the child feel its inferiority. From these unfortunate ones has been developed a number who have shown genius in certain lines of handwork, art and music. Her answer to all criticisms of the child is "Do not blame the child for not being born normal; seek the cause in its ancestors."

The club held its annual social June 9, with Ernest E. Cole, assistant superintendent of Chicago schools, as the principal speaker. He discussed the educational problems to be solved after the war. Music, refreshments, and good fellowship were the order of the evening.—*H. J. Barber.*

#### A COMMUNITY ART PROJECT.

The art department of the Springfield, Mass., schools aims to be universally helpful to students in classroom and to the community at large. Art is taught not for its own sake so much as for the life values which it possesses. The supervisors and the teachers hold to this policy of helpfulness by seeking continually for means of aiding school and civic projects.

Previous to the school year 1917-18 the monthly bulletin published by the Springfield City Library was most valuable in subject matter but failed to attract attention because of its very prosaic appearance. It was realized that something was necessary to make the bulletin of interest to the patrons of the library. The problem, it appeared, might be solved by improving the artistic appearance of the cover, not at all a new idea, but one that had not been applied in the case of the bulletin. The problem was believed to be especially worth while for the classes in applied design in the Springfield junior high schools. The practical value of the work as taught in the classes might at the same time be tested by this thoroly practical project.

In accordance with this conviction a competition was arranged with the Junior III (9th year) pupils in four junior high schools. The children were required to make sketches in pencil, charcoal and ink and from among all the designs 150 were chosen and submitted to a jury representing the library staff and the heads of the art departments in the two senior high schools. This jury selected one design for the cover for each month's issue of the bulletin during the current school year. No prizes were offered but the honor of having a design chosen was considered sufficient recognition for the successful students. The illustration on this page reproduces three typical designs which were accepted and published during the winter. The work was carried on under the direction of Mr. C. Edward Newell, supervisor of drawing.

#### CO-OPERATIVE SCHOOL PLAN ADAPTED TO SHIPBUILDING.

The necessity for conserving the educational interests of the nation becomes more urgent as the demand for skilled workers in many lines of war industry becomes more insistent. It is absolutely imperative that adequate measures be taken to insure a continuous supply of competent workers.

As a contribution to this end the United States Bureau of Education has issued a statement of "Government Policies Involving the Schools in War Time," from which the following paragraphs are taken:

"Boys and girls should be urged, as a patriotic duty, to remain in school to the completion of the high school course, and in increasing numbers to enter upon college and university courses, especially in technical and scientific lines, and normal school courses, to meet the great need for trained men and women.

"It would be helpful in cities, and especially in industrial communities, if for boys and girls over 14 years of age in or out of school there could be introduced certain definite courses looking toward a co-operative half-time plan of school attendance and employment thruout the year."

In November, 1917, there was added to the list of such plans now in operation, a co-operative plan for the training of shipyard mechanics inaugurated by Girard College, Philadelphia, and the Chester Shipbuilding Company, Chester, Pa.

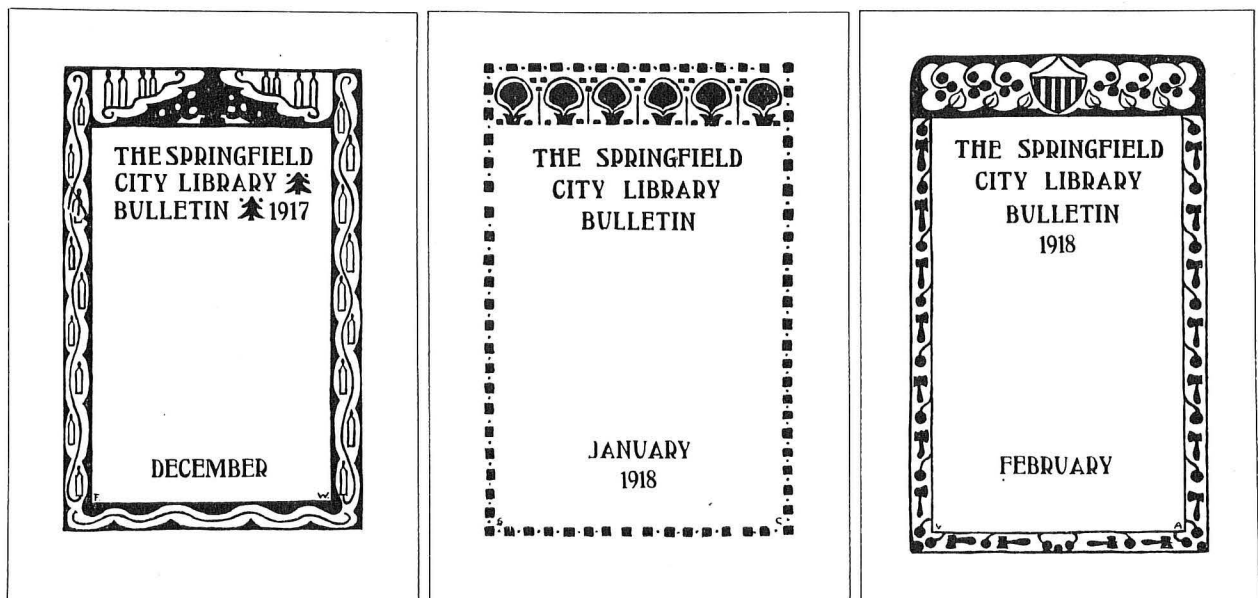
Two groups of fourteen students each have been selected from the technical school of the college, representing the following trades: Pattern-makers, 2; marine machinists, 6; machinists, 4; shipfitters, 5; blacksmiths, 2; joiners, 4; loftsmen, 3; electricians, 2.

The two groups, designated as "Group A" and "Group B," alternate for instruction at college and shop practice at the shipbuilding plant in two-week shifts. In the plant the boys are paid at the rate of 33 cents per hour, and work eight hours per day.

The shopwork of the students is inspected at intervals during the day by a supervisor, who is in charge of the co-operative plan. Hearty co-operation on the part of the management, foreman, and workers has been an important element in the success of the plan.

In connection with the shopwork each student submits a daily report, giving a brief account of the day's work, experiences, and observations. This serves as a record of progress, as well as a lesson paper. It is regarded as an essential part of the plan, as the boy is required to explain the terms and processes of the work he is doing. The report is corrected, typewritten, and copies furnished to the student, the foreman of the shop, officials of the various departments of the plant, and the authorities of the college.

Leadership in the shipbuilding trades thru actual contact with both theory and practice is the aim of the course.



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# NOW, ARE THERE ANY QUESTIONS?

This department is intended for the convenience of subscribers who may have problems which trouble them. The editors will reply to questions, which they feel they can answer, and to other questions they will obtain replies from persons who are competent to answer. Letters must invariably be signed with full name of inquirer. All questions are numbered in the order of their receipt. If an answer is desired by mail, a stamped envelope should be enclosed. The privilege of printing any question and reply is reserved. Address, *Industrial-Arts Magazine, Milwaukee, Wis.*

## Books on Toymaking.

814. Q.—I am rather interested in the subject of "Toymaking." Have you any special book which shows how to make toys with cloth, silk, paper, and wood?—*Cheng Yunchong, Tientsin, N. China.*

A.—*Harper's Outdoor Book for Boys*, Joseph H. Adams, Harper Bros., New York; *Adams's Toymaking at Home*, F. A. Stokes & Co., New York; *Rich's When Mother Lets Us Make Paper Box Furniture*, Moffat, Yard & Co., New York; *Hall and Perkins' Handicraft for Handy Girls*, Lothrop, Lee & Shepard, Boston; *Johnson's Toys and Toymaking*, Longmans, Green & Co., New York; *Beard's Jolly Books of Playcraft and Boxcraft*, F. A. Stokes & Co., New York; *Kelland's American Boys' Workshop*, David McKay, Philadelphia, Pa.; *Paret's Handy Book for Girls*, Harper Bros. Co., New York; *Campbell's American Girls' Home Book of Work and Play; Something to Do Girls*, Wilde & Co., Boston; *Hall's Boy Craftsman*, Lothrop, Lee & Shepard, Boston; *Toy Furniture for Children to Build*, H. A. Hart, \$0.50, Platt & Nourse, New York; *Carr and Brady's Cigar Box Furniture*, 15 cents, Capital Supply Co., Pierre, S. D.; *Adams and Elliott's Wood, Wire and Cardboard*, E. P. Dutton & Co., New York; *Berry's Spinning Tops*, \$0.85, E. S. Gorham Co., New York; *Sage's Toy Army I Can Make*, \$0.75, Platt & Nourse Co., New York; *Moore's Manual Training Toys for the Boys' Workshop*, Manual Arts Press, Peoria, Ill.; *Toy Soldiers*, \$1, Sully & Kleinteich, New York.

## National Society Headquarters.

816. Q.—Your April number of the *Industrial-Arts Magazine* gives an interesting account of the recent meeting of the National Society for Vocational Education. Please give me the address of the secretary of the society.—*J. S. L.*

A.—The headquarters for the National Society for Vocational Education are located at 140 West 42nd Street, New York City. The president is Dr. David Snedden, Teachers' College, Columbia University.

## Splints.

817. Q.—Do you know of any firm which furnishes cane, rush, ash or hickory splints?—*E. M. F.*

A.—*Cane and rush*—Lusky, White & Coolidge, Chicago; *Ash splint*—C. N. Saba & Co., 305 Yong St., Toronto, Can.; *Fiber*—Fiber Grand Co., Grand Rapids, Mich.; Grand Rapids Fiber Cord Co., Grand Rapids, Mich.; Kennebunk Mfg. Co., Rochester, N. Y.; Everett B. Frain Co., 723 So. 5th Ave., Chicago; *Hickory*—David Hardin, Plattsville, Ky.

## Oblique and Isometric Projection.

818. Q.—Will you kindly advise me as to where I can obtain some good material on cabinet and isometric projection?—*C. R. C.*

A.—*Warren's Industrial Drawing*, Part III, John Wiley & Sons, New York; *Frank's Essentials of Mechanical Drawing*, Milton Bradley Co., Springfield, Mass.; *Kronquist & Berg's Mechanical Drawing*, Manual Arts Press, Peoria; *Woolley & Meredith's Shop Sketching*, McGraw-Hill Book Co., New York; *Weick's Mechanical Drawing Problems*, McGraw-Hill Book Co., New York.

## Making Table Top.

822. Q.—The other night I had to teach a class of boys for the inspection of the local Commercial Club. One of the boys was making an old commode into a kitchen cabinet by building on a larger top to work on and making an upper part with four closets. That night the boy was planing the top board, which was composed of three boards. I had instructed him to plane each edge to be glued up separately, matching two edges at a time, trying the same two edges until true and tight; then planing the other two.

A local carpenter told him that that was no way to join three boards. He claimed that the three boards should be put into the vise at one time and planed 'all together. Am I wrong?—*J. F. S.*

A.—You are absolutely right. Your method is strictly correct and especially for the boys. It will result in a saving of time and in much better joints.—*S. J. Vaughn.*

## Finishing Mahogany and Whitewood.

820. Q.—I would like to know the best method of finishing mahogany that is not too tedious for junior high school boys, and that will produce a durable finish.

I would also like a similar finish for whitewood.—*J. F. S.*

A.—Replying to the correspondent, I will say that tedious work is the price of a durable finish and that one may not produce the latter by hand methods without an expenditure of considerable effort. The only way in which hard work may be saved is by the installation of expensive spraying machinery and the use of finishing materials like lacquer, which are too fast drying to be brushed. In a junior high school the boys above all else should receive training in the fundamental principles of trade practice and should not be encouraged to avoid a method because it may seem to indicate something of a tedious process.

To enable them to produce a durable finish on mahogany, it will be necessary first that the wood be sponged with plenty of clear water in order that the grain and indentations may be raised and the pores fairly opened up. When the wood has dried thoroly it should be carefully sanded with the grain, using a sanding block and No. ½ paper. If the block be about an inch and a quarter by three by five inches and covered on one face with quarter-inch felt, the sanding will be done more evenly and quickly than is possible otherwise.

Following this, the work should receive a coat of potassium bichromate and sodium carbonate, one ounce each per gallon of water. Bismark brown may be dissolved in alcohol and water to the extent of two ounces of stain, three quarts of water and one quart of denatured alcohol. When the solution of the aniline is complete, this may be applied over the alkali coat to produce any shade of red or brown mahogany, depending upon the strength of the two solutions used.

After the second stain coat has thoroly dried, brush on a very thin coat of orange shellac, reduced one-half with alcohol. This method will stiffen up whatever grain may have raised, hold down the color so that, when the shellac is thoroly dry, it may be sanded glass smooth with 00 paper, dusted off and the wood filled with a silex filler, shaded to a rich chocolate brown thru the use of one part burnt umber in oil, one part of Van Dyke brown in oil and one-half part rose lake in oil. Filler should be reduced to the consistency of skim milk with turpentine or gasoline, brushed on across the grain and allowed to set until it has lost the turpentine gloss, rubbed across the grain with a piece of burlap and cleaned up with a fresh square of the same material. I find that bags, roughly slashed with a sharp knife so as to make about eight-inch squares, give convenient pieces of burlap for this class of work.

Let the filler dry 48 hours, remove any cloudy spots by lightly sanding with 00 paper, dust off and proceed to varnish. Let this coat dry from three days to a week, sand smooth with 00 paper, dust off and give a second coat. This may be repeated up to four coats in order to produce a durable finish, the last coat being rubbed out with felt pad, FF pumice stone and water to a smooth surface. Wash, dry with chamois and clean up with a good oil polish.

## Finishing Whitewood.

This process may be used on whitewood or basswood with the omission of the filler. I might say that on basswood beautiful shades of brown may be produced if a first coat be given the wood by dissolving two ounces each of tannic and pyrogalllic acids in a gallon of water. A second coat should be the alkali solution as described above. The longer this second coat is allowed to dry, the richer and darker will be the color since it is developed thru the absorption of atmospheric carbon dioxide. Following this the work should be shellaced with orange shellac, reduced one-half with alcohol, and when dry, sanded smooth. Either a dull or glossy

varnish may be used at this point, according to the taste of the individual. The dull varnish of course precludes the necessity for rubbing, but the last coat should be sanded smooth with 0000 paper after drying and cleaned up in a good oil polish.—*Ralph G. Waring.*

#### Refinishing Maple.

821. Q.—I have been asked to repair and refinish a maple desk which dates back to before the Revolution and so is very valuable to the owners. It has been stained with what was apparently a dark water stain which is quite hard to scrape off. Over this at some time it has had a couple of coats of shellac and varnish.

I am thinking of using dark mahogany water stain on it and wish I could get a description of the process of finishing this maple to resemble mahogany. Will the stain splotches all have to come out?—*K. W. R.*

A.—I am basing the following suggestions on an identical experience with a maple desk which the owner desired refinished in mahogany. There is no alternative other than scraping and sanding this wood down to the clear maple. Undoubtedly old sap stains will mar the complete whiteness of the maple, since it was for this reason that it was probably stained mahogany originally. If the correspondent attempts to finish this piece in the manner followed by the Adam Brothers, who originated this particular style and piece of furniture, he will finish all portions in mahogany, except the front edges of the top shelf, the front edges of the sides and the face edges of the spreaders between the drawers. These portions he will leave as light as may be or give them a slightly yellow cast by oiling with turpentine and a little linseed oil previous to the application of the mahogany stain to the rest of the case and drawers. It is best that he disassemble the piece as far as may be done in order that the scraping, staining and finishing may be more easily performed. The stain I am suggesting that he use may be either a good commercial brown mahogany or one based on the following formula:

First coat the wood thoroly with a solution of tannic acid and pyrogallol acids, two ounces each per gallon of water. When this is quite dry, coat with a second solution made of one ounce of potassium bichromate and two ounces of sodium carbonate (sal soda) per gallon of water. Allow this to stand until thoroly dissolved and then apply generously to the wood, allowing it to dry at least 48 hours in order that the carbon dioxide in the air may produce a rich brown color. To get the red tones it will be necessary to coat the work with a solution of one ounce of Bismark brown aniline boiled in one gallon of vinegar, using a glass or earthenware vessel.

This process in reality is not as long or tedious as may seem. The penetration of the stain is good and any shade of red brown mahogany may be produced by the reduction or increase of the amount of Bismark in the vinegar. Altho effects of great beauty and clearness are produced when applied to the wood in the manner described, do not attempt to mix these different solutions, since precipitates will form. Between the red and brown coats it may be advantageous to sand lightly with 00 paper.

After thoroly drying the red stain coat, the piece should be sized with a coat of orange shellac, slightly tinted with alcohol-soluble Bismark brown and jet black nigrosine in a rich brown color. Stock shellac should be reduced one-half with alcohol. After this has dried perfectly hard, sand lightly, dust off and carry to the varnish room where a coat of good varnish should be carefully brushed on. This should be allowed from three days to a week to dry, carefully sanded smooth, wiped clean with a tacky cloth, made by saturating a piece of cheese cloth with waste varnish and wringing dry as possible. This will effectually remove any fine lint or dust which the brush, sponge or chamois may have left.

This process should be followed until at least four coats have been applied, the last two having been rubbed out with felt pad, FF pumice stone and water to a perfectly level surface. Always rub as nearly with the grain as possible. It is sometimes of an advantage, however, to cross rub both ends of a drawer front and finish up the whole front with the grain. In this way the ends are done more quickly and better than by rubbing the whole piece in the usual manner. After sponging dry, clean up in a good oil polish, using a piece of old silk for the final clean up.

In case there are any brass trimmings, these may be buffed and lacquered and preferably should be left in the pumice buff rather than the rotten stone buff, altho I have seen some old pieces with the highly polished trim. No trim should be left on the desk during the staining and varnishing, since it is in the way and bound to be covered with stain and varnish materials. This is especially true of hinges and knobs.—*Ralph G. Waring.*

#### Joints in Woodworking.

823. Q.—I should like very much to secure a book illustrating all the practical joints in wood construction, with discussion as to their value in manual training work.—*W. W. F.*

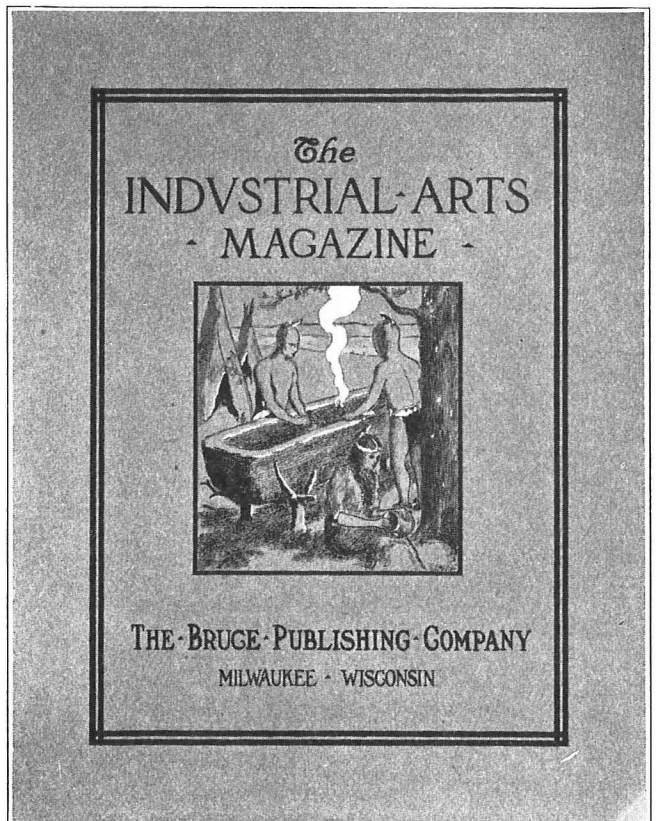
A.—*Noyes' Design and Construction in Wood* (Manual Arts Press) contains all the practical joints that the average student will need. The present tendency in both elementary and secondary manual training is away from extreme inclusiveness in teaching joints. It is the natural reaction from over-emphasis on types of construction used very infrequently by cabinet makers. It is better to limit the number of joints to those commonly used and to teach them well.

#### Books on Household Physics.

825. Q.—I am looking for a text on household physics suitable for a class of girls in the fourth year of high school. Do you publish such a text?—*E. S. J.*

A.—*Butler's Household Physics*, \$1.30, Whitecomb & Barrows, Boston; *Lynde's Physics of the Household*, \$1.25, Macmillan Co., New York; *White's Fuels of the Household*, \$0.75, Whitecomb & Barrows, Boston; *Safety for the Household*, (Bulletin No. 75, 1918), Circular of the Bureau of Standards, Commerce Department, Washington; *Keene's Mechanics of the Household*, Agricultural College, North Dakota, (1913).

The school children of Dubuque, Ia., have made a number of knitting needles for use in knitting five-inch squares for the Red Cross. Upon the suggestion of Miss Mary Brownson, director of drawing, the children were given dowels cut in twelve-inch lengths. With a pencil sharpener, one end was brought to a point and a kindergarten bead was glued to the other end. In the domestic science and art departments, the pupils have undertaken Red Cross and community work and have carried out the regulations for food conservation.

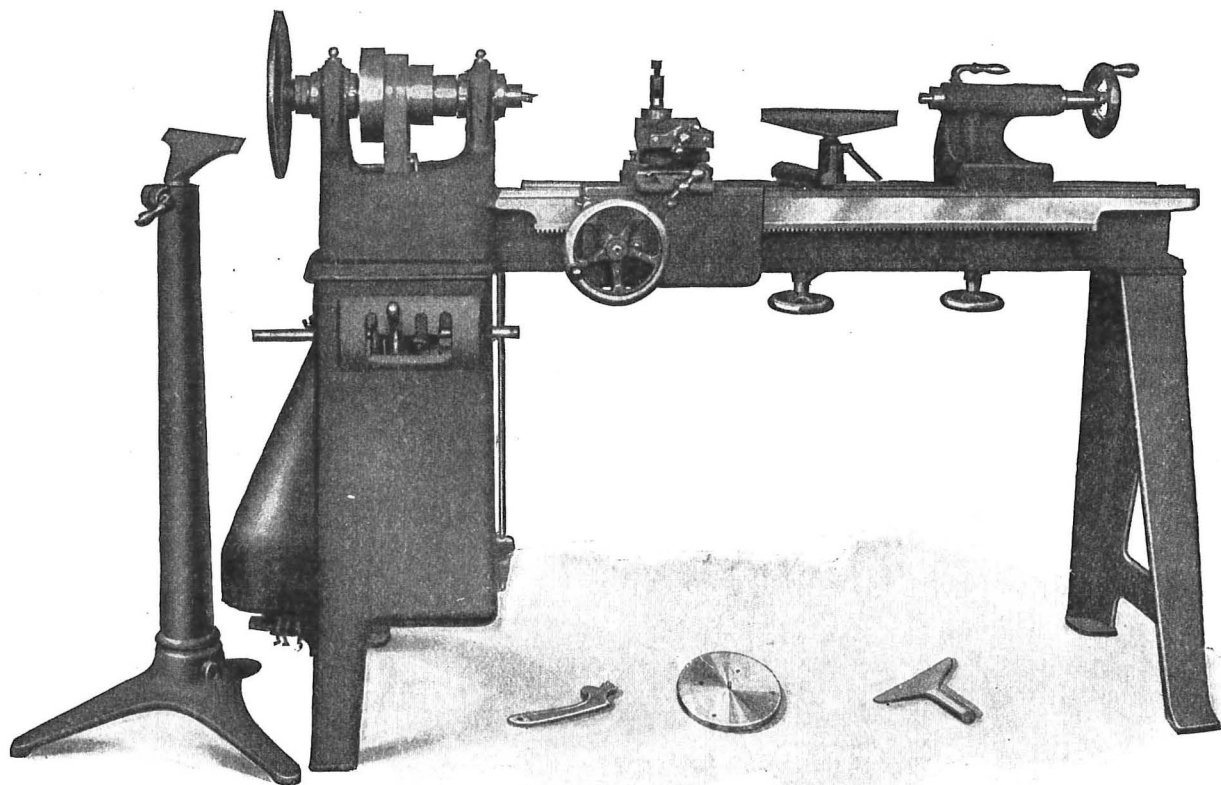


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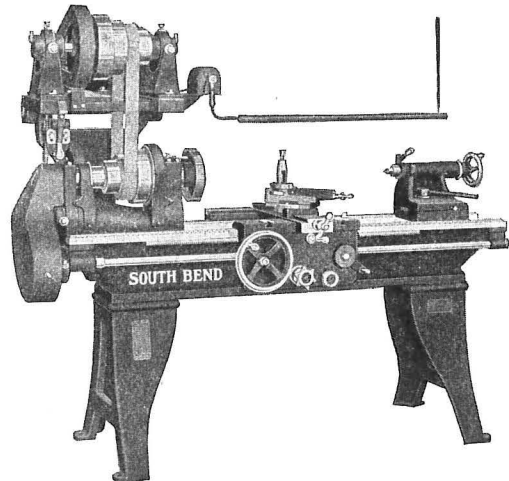
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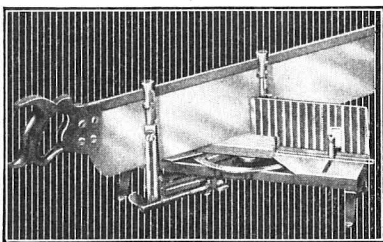
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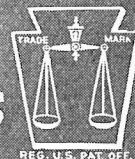
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## THE LARGEST IN THE WORLD.

### MEETING OF THE SOUTHEAST TEXAS INDUSTRIAL ARTS CLUB.

The Southeast Texas Industrial Arts Club met at Huntsville on April 26th. Vice-President A. B. Mays presided at the general session. Pres. H. F. Estill, of the Sam Houston State Normal, gave the address of welcome to the visiting teachers.

The educational part of the meeting was taken up with a discussion of the Smith-Hughes Law by the state director of vocational education, Mr. N. S. Hundeen. Mr. Hundeen treated in a thoro and practical manner, the many questions regarding the application of the law.

Following the general session, the manual training and home economics teachers went to their respective meeting places where they held their round-table discussions. President A. B. Mays called the meeting to order.

Mr. T. Butler, of Port Arthur, who discussed the subject, "Our Part in Winning the War," reported on the war work accomplished in his schools. He told of the Y. M. C. A. tables made in his classes and described his method of getting out the work. The students were divided into groups, under the supervision of student foremen, and each group was responsible for its own work. Incidentally he told of the marvelous growth of Port Arthur.

Mr. C. J. Sherman, of Houston, Tex., described the making of Red Cross shipping boxes, cabinets and other equipment by the manual training classes. He also told of the work of the manual training teachers in the making of furniture for a Red Cross House at Camp Logan. Mr. Sherman uses a modified factory system for his projects and assigns the work to the rapid and advanced students in order that individual projects may not be slighted.

Mr. J. B. Moncreif told of the making of checkers for the Y. M. C. A. at Camp Logan and the construction of garden rakes for the war gardens. Alternate weeks were given to these special projects and every boy devoted his time to the work outlined for the week.

Mr. E. M. Wyatt, of Houston, discussed the attitude

taken by the city manual training teachers toward all forms of war work. He declared that Houston teachers felt that the needs of the government took precedence over individual needs and he expressed the opinion that war activities had not been detrimental to the industrial training of the students. He pointed out that a course of study is like a counter plane in the carpenter's kit—a fine tool for the purpose intended, but one that many carpenters feel justified in leaving at home. A course of study is a tool for education but there are times when it is in the way and we should not hesitate to leave it at home when we are going on an educational job, when it is more in the way than a help.

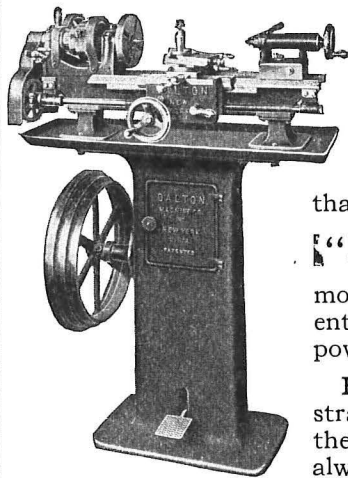
Mr. N. S. Hundeen, state vocational director, expressed the opinion that the war work has done little if any harm to regular educational work in the schools. He believes that the work has been more beneficial from an educational standpoint and he points to the radio and automobile classes as additional aids to the government. Mr. A. B. Mays, of the East Texas Normal School, pointed to the need of conservatism in the work and mentioned some instances where the regular work had suffered thru over-emphasis of these activities.

"Woodwork Only Versus Large Variety of Materials," was discussed by Mr. A. B. Mays, in the absence of the regular speaker. Mr. Mays, in introducing his subject, divided manual training teachers into two classes. In the one class are included teachers who advocate a number of short courses tending toward trade training as an aid in the selection of a lifework. In the other class fall those teachers who believe that boys should be taught typical mechanical processes thru one or two subjects, with emphasis on thoroness and effectiveness.

Mr. T. A. Butler, of Port Arthur, told of the successful experiments conducted at the Kansas State Normal with a number of short-unit trade courses for boys. Mr. Hundeen described the work of Mr. Fox at El Paso in giving to his boys a variety of trade experiences thru teaching several kinds of work. Mr. Hundeen characterized the work as most

(Concluded on Page XXI)

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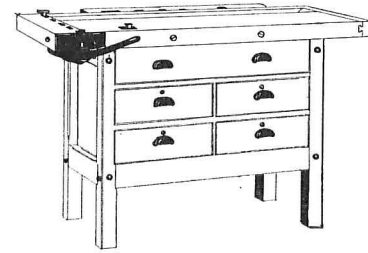
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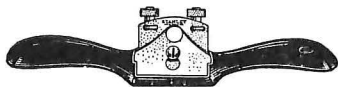
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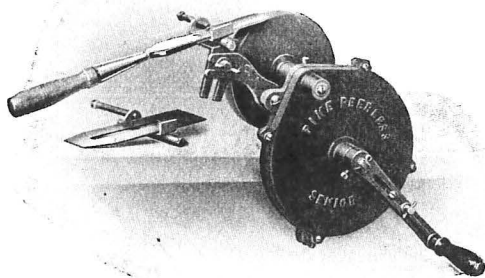
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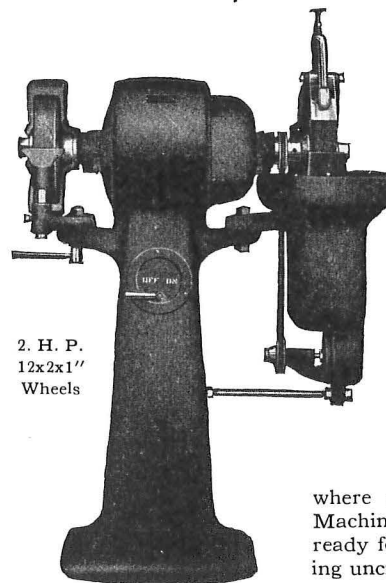
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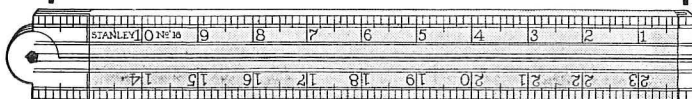
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(Concluded from Page XIX)

efficient and declared that the students actually received a good trade training under Mr. Fox.

"Importance of Speed in Manual Training Work" was undertaken by Mr. T. A. Butler. He pointed out that more attention should be given to speed in manual training shops but emphasized economy in system, method and operation rather than swifter work. He urged that manual training teachers become, as it were, efficiency experts, in order that they may become familiar with the short cuts to production.

At the close of the round table, Mr. E. M. Wyatt, Mr. C. H. Sherman and Mr. Harris were appointed members of the resolutions committee.

The following resolutions were adopted by the association:

(1) Resolved that our schools should in every way possible do work to aid the government in winning the war. It is also our opinion that very little, if any, such work has been asked of our public schools that has interfered with the regular school work to the extent that it has not been compensated for by other desirable features.

(2) The club recognizes the desirability of using other phases of manual training than woodwork, but does not care to decide between the two schools which we recognize—that favoring a variety of trade experience and that favoring stress on typical processes applicable to many trades.

(3) The club advocates more stress being put on the matter of speed in all construction work, but that it should be thru efficiency of movements, systems, and saving of false, unnecessary movements rather than thru swifter movements.

The officers elected were: Mr. Stuart MacKay, Houston, president; Miss Marcia B. Turner, Port Arthur, vice-president; E. M. Wyatt, Houston, secretary-treasurer.—E. M. Wyatt.

#### PERSONAL NEWS NOTES.

Robert M. Smith, supervisor of manual training in the Chicago public schools, has announced his resignation, effective with the close of the school term.

Herbert Briggs, director of vocational education at Terre Haute, Ind., has resigned.

John B. Coleman, of La Crosse, Wis., has been elected director of the Green Bay Vocational School to succeed E. E. Gunn, Jr.

Oscar L. Dudley, educator and veteran G. A. R. man, died May 4th, at Bangor, Mich. Mr. Dudley was one of the first men to take up the work of rescuing homeless boys and was responsible for the establishment of the Illinois School of Agriculture and Manual Training for Boys at Glenwood, Ill.

Lawrence Stephens, instructor in manual training at Batavia, Ill., has resigned to enter the military service.

R. E. Grose, assistant instructor in manual training at Watertown, S. D., has become director for the entire department for the next year.

Miss Juanita Perkins, instructor in domestic science at Kanawha, Ia., has accepted a position with the Ames Extension Division at Ames, Ia.

Robert Owens, instructor in manual training at Salem, O., has resigned to enter the government service.

Miss May Allinson, acting secretary of the National Society for Vocational Education, has been appointed executive secretary of the Committee on Women in Industry of the Advisory Committee, Council of National Defense.

### Wanted:

One instructor in machine drafting and mathematics, also one instructor in applied electricity, for trade school in Middle West. Should have industrial experience. Give full particulars regarding age, education, experience, salary.

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Catalogue No. 16, showing Domestic  
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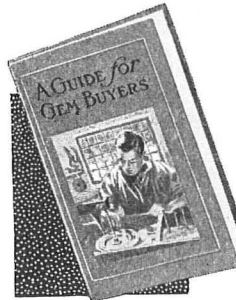
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## NEWS AND NOTES FROM THE FIELD.

Edward F. McSweeney, representing the Massachusetts Committee of Public Safety, recently urged the ways and means committee to introduce a bill in the Massachusetts legislature providing for the extension of state-aided vocational education during the period of the war. He urges that the vocational school law be changed to provide that persons over 25 years of age may be able to attend. He also urges that the restriction of registration in courses to those in which the person is engaged be removed. Mr. McSweeney points out that the government is calling for numbers of skilled workmen and that it is impossible to draw workers entirely from the occupations affected.

The Detroit industrial classes in day and evening schools are to share in the subsidies granted by the federal and state boards of vocational education. The evening classes, which will share the largest in the fund, cost the city \$100,000 last year.

The mayor of New Orleans will shortly appoint nine men who will form the Board of Managers of the Isaac Delgado Central Trades School. The mayor is to be a member of the board, with the commissioner of the department of public property, the superintendent of schools, the president of the New Orleans school board, and one member of the board. The four other members are to be selected at large by the mayor, with the approval of the council. Two are to be appointed for two years and two for four years. They serve without compensation and must be 35 years of age.

Ow Tin-Chin, the Chinese Educational Commissioner to the United States, and Samuel D. Wu, his assistant, are visiting the schools of the large cities, giving special attention to the vocational schools. They have visited the Columbus public schools and colleges and a number of schools in the large cities of Ohio.

The girls of the high school at Salem, Ohio, have entered upon a practical course in sewing and cooking, also home book-keeping. The bookkeeping work is taken under the direction of the commercial department and has for its purpose accurate accounting and thrift in the home.

The boys of the manual training department at Superior, Wis., have made a number of boats which they have donated to the Y. M. C. A. Two boats and three canoes were built, one being original in design and the others copies of patterns.

The boys of the manual training department of the Junior High School, Parkersburg, W. Va., have made a number of pieces of furniture and school equipment during the past year. The school projects included repair work in the manual training room, making of Red Cross banners and flags, lumber rack, shelves in cupboards of rooms, tool racks and benches.

An automobile course has been begun at the high school, Colorado Springs, Colo. About thirty boys, in two sections, are taking the course. The course covers two class periods each day and includes a preliminary study of tool smithing and forge work.

A summer school for blind men and women has been opened at the state school at Vancouver, Wash. Courses are offered in broom-making, typewriting, woodwork, caning, mop-making, sewing, knitting, weaving and basketry.

A survey of the vocational schools of Buffalo has been begun in accordance with the provisions of the Smith-Hughes Law.

Evansville, Ind. The boys of the manual training class of the high school have made ball bats for the pupils of the city schools.

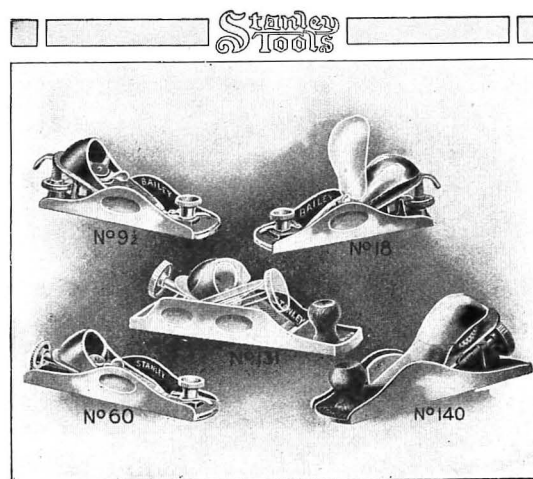
The manual training department of the Williamsport, Pa., schools has begun the construction of four large tent floors and fifty small tent floors which is to be finished on contract time.

Vocational education in the schools of Virginia, Minn., will be extended in scope with the completion of the new high school building in the fall. The change follows an extensive survey conducted by Mr. C. A. Prosser and Mr. H. W. Kavel, of Dunwoody Institute, Minneapolis.

In addition to giving increased vocational opportunities, it is planned to introduce the six-and-six plan, with vocational work beginning with the seventh grade and continuing thru the six years where the pupil is able to complete the work offered. This will not provide a complete trade course but will offer a start toward a specific trade.

Colusa, Cal. The board plans to remodel the old grade school into a manual training and play center. The manual arts and domestic arts work will be centered in this building.

A movement has been started in Terre Haute, Ind., to abolish the vocational school because of the expense. It is pointed out that the school is temporary in character and that it is not suitable in construction or arrangement for a school of this kind.



## STANLEY BLOCK PLANES

A Block Plane was first made to meet the demand for a Plane which could be easily held in one hand while planing across the grain, particularly the ends of boards, etc. The latter work many carpenters call "blocking in," hence the name "Block" Plane.

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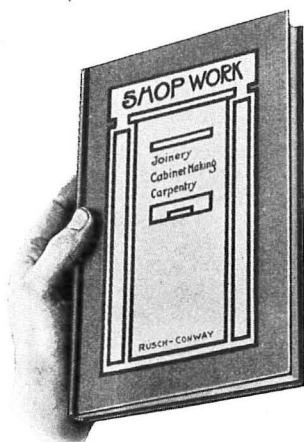
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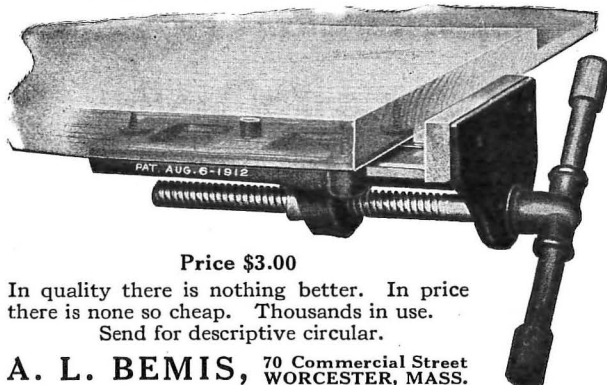
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## ABOUT PRINTING OUTFITS

It is a pretty general rule that those schools which have printing outfits stand at the top of educational, manual training and vocational institutions in the country. Such schools as the Dunwoody Institute, Minneapolis, the Gary, Indiana, system, the Indianapolis schools, the Stout Institute of Menomonie, Wisconsin, the DeKalb Northern Illinois Normal, the Hammond and South Bend High Schools and hundreds of others equally prominent in educational matters, give their printing departments very liberal credit for their good work. They agree that printing correlates with every other department and study; it inspires and helps them all.

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SPRINGFIELD, MASS.

The boys of the vocational school at Johnstown, Pa., have begun the construction of tables and benches to be used in the farm camps of the Boys' Working Reserve. The seats are fastened to the tables in such a way that they may be taken apart and put together with bolts.

The first class in laundry work has been opened at the vocational school at Memphis, Tenn. The course covers two weeks and is open to girls over 16 years of age. Positions paying from \$8 to \$9 are open to those who complete the course.

Davenport, Ia. The board has extended the manual training and domestic science course to include the grades from the ninth to the fifth grades. While formerly this work was limited to the high school and the ninth grade, it is now decided to offer these opportunities to pupils who do not expect to reach the high school.

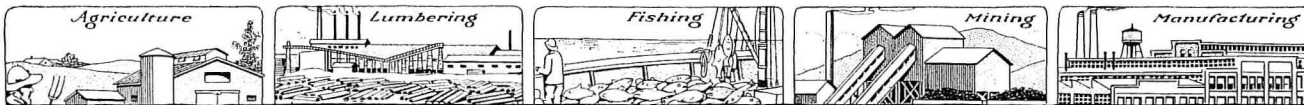
The University of Arkansas is offering special courses for teachers in the subjects of agriculture, home economics, and manual training. The courses are intended to prepare teachers for work in the high schools of the state which are to receive federal aid for vocational subjects.

A remarkable example of school printing is the June issue of "The Mirror," the class magazine of the eighth-grade pupils of Public School 24, Jersey City, N. J. The magazine, which is designed, set up and printed in the school shop under the supervision of Mr. Harry W. Osgood, instructor in manual training, is entirely the work of the boys. Quite remarkable as an original linoleum block print is the cover which is executed in four colors. Still more meritorious is a four-color reproduction of Maxfield Parrish's well known painting, "An Arch Encounter," which forms the frontispiece of the magazine.

The ranks of the teachers of manual training in the smaller cities have become greatly depleted due to war conditions and to the inability of the normal schools and universities to supply demands in the way of instructors.

To remedy this condition, a war emergency teacher-training course has been introduced at the Lane Technical High School, Chicago. The course is given in connection with a fourth-year elective woodworking course at the school and the students must have had four years of technical work in addition to four years of mechanical, machine and architectural drafting. About

(Concluded on Page XXVII)



# Trade Foundations based on Producing Industries

For Grades 7-8-9 First Edition Ready About July 1, 1918

Here is the book you have visioned, the one forecast by experience with your own students, the text you have hoped would appear sooner or later.

ONE BOOK—Broad in amount of ground covered, specific in trade information presented, practical on account of the workable shop suggestions—a text which brings before students an interesting treatment of producing trades and acquaints them with duties of tradesmen, one which widens their viewpoint and extends their possibilities—a book dedicated to the important work of assisting students “to find themselves.”

This text, so comprehensive, so big in its plan, has become a realization thru the combined efforts of various men, each especially qualified to contribute his portion. The scope of its material is indicated by the following outline—

## TRADE FOUNDATIONS based on PRODUCING INDUSTRIES

Especially designed for Grades 7, 8, 9

### Introduction.

#### Table of Contents.

**Part One—OCCUPATIONS** by R. H. Rodgers, Director of Industrial Arts, Stout Institute.

A most interesting and effective treatment of the Boy and the World's Work—Choosing One's Occupation—Training for Life's Work—the Growth of Industry—Present Day Occupational Life—the PRODUCING INDUSTRIES with emphasis on individual trades and each treated from different angles. All material presented is to the point, many illustrations and graphic charts are included, the whole constituting a valuable line of Vocational information.

**Part Two—MATERIALS** by J. I. Sowers, Director of Vocational Education, Vincennes, Ind.

The materials used in producing industries are here presented under source headings, namely, plant, animal, mineral. This information is quite specific and is illustrated by excellent cuts, the object being not only to give the students data on essential trade materials, but to set forth their forms, their commercial states and adaptability for use.

**Part Three—TOOLS** by L. Day Perry, Supervisor of Manual Training, Joliet, Ill. Thru specialization and for specific purposes tools, machines and equipment have been developed to save time and effort, to increase production. This development is traced to indicate progress and to bring out the reasons for kinds and types. Each trade has its special set or outfit and these are presented in that manner. This has not been done before in school texts and is most effective in building up proper understanding of this phase of trade information.

**Part Four—PROCESSES AND OPERATIONS** by Charles W. Sylvester, Director of Prevocational and Vocational Education, Hammond, Ind.

With information on trades, trade materials and equipment of the workers, naturally the processes or operations of the tradesmen should be discussed. These are offered under trade headings and, besides the simple, clear description of each, specially drawn sketches illustrate the processes. There are about 200 such illustrations. This section adds a further step to the student's Prevocational advance by showing him “how” the tradesmen work.

**Part Five—DRAWING** by George M. Brace, Supervisor of Architectural and Mechanical Drawing, Central High School, St. Paul, Minn.

The history of drawing, what it is, its uses, etc., are given; then the different kinds are presented from the trade point of view. Since drawing is the language of the worker, this method causes the student to understand it as used in practice, the idea being to enable him to identify drawings and to decide on kinds for specific representations. There is special explanation accompanied by plates of drawings for each kind. No course is intended, but to bring out the trade significance, to lead the student to further study is the mission of this section.

**Part Six—PROJECTS** by various directors and tradesmen located in different parts of the country.

Section 1 offers an elementary course for beginners to give them, if desired, some knowledge of tools in the average shop and skill in using them before attempting the real project work. It is also a valuable assistance to those teachers with limited training and experience who may be required to look after some shop classes.

Section 2 is made up of real Prevocational Projects, projects which indicate certain trades or industries or represent units of work in them. These enable the student to duplicate to a certain extent the work of tradesmen, to apply what he has learned from study of other parts of the book, or they may be studied and not constructed. They are very valuable in further broadening the vision of the student. Since men widely separated prepared the projects they do not apply to any certain locality, but are “general.”

**TO THE INSTRUCTOR**—This chapter gives special suggestions in the use of the book. It explains the plan followed in project development which will assist in working out other projects, in fact, there is an extended list of projects (by trades) which may be so worked out.

**INDEX**—The book not only has an extended index for handy use, but the different sections contain cross references.

### General Description

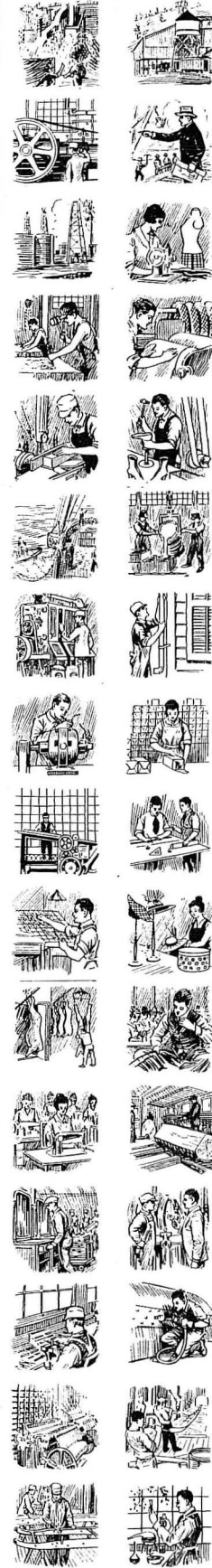
Good paper, readable type, very substantially bound in cloth, over 400 pages 6"x9", more than 350 illustrations, all especially made for the book and many of them full page plates. \$1.25 list. Special rate for adoption.

Requests for copies of Trade Foundations Based on Producing Industries for examination should be accompanied by statement of number of pupils in grades 7, 8, 9 taking shop work this school year and probable number of copies required, if text is adopted.

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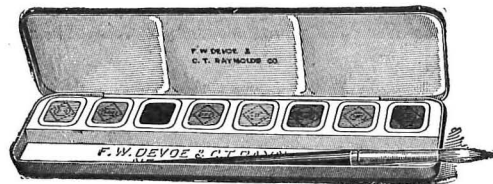
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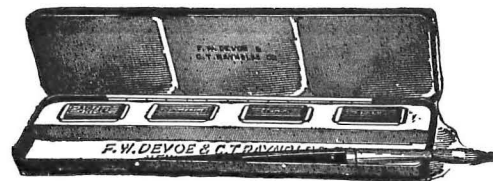


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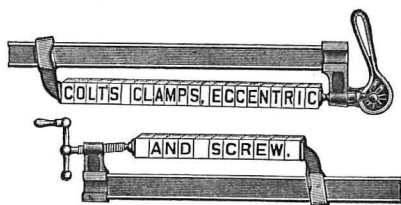
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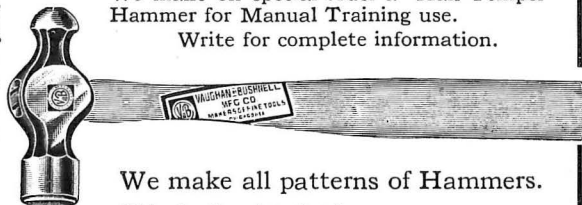
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(Concluded from Page XXIV)

21 young men have entered upon the course in preparation for teaching shopwork during the next year.

An eighth-grade class in manual training in the Denver schools annually binds the professional magazines of the supervisor of manual training. The class thus has a very specific and thoroly motivated problem and the supervisor has his professional library bound in a most substantial form.

Specialized training in the grade and high schools of Pittsburgh, thru the co-operation of the schools with Carnegie Institute of Technology and the retail stores of the city, has been provided with the formal approval of the board. A bureau has been established at Carnegie and a fund of \$160,000 has been provided thru the generosity of citizens. A research and teaching staff of more than 25 persons has been organized which will investigate methods of selection and promotion of employes in retail establishments and develop training courses.

The fundamental experiment will be carried out thru three agencies, the retail stores, the public schools, and the institute. The part-time courses in the schools will be enlarged to make it possible for pupils to remain in school.

#### PERSONAL NEWS.

Mr. Herman Hjorth has accepted the position of director of the San Juan Technical and Vocational School at San Juan, Porto Rico. The school, which opens for the first time on August 5th, is to be the center of the vocational education system which the department of education is building up in the Island.

Mr. Ralph O. Edick, of Winslow, Ariz., has accepted the position of director of the Manual Arts Department and of the Band of the Northern Arizona Normal School at Flagstaff. Mr. Edick was formerly supervisor of manual arts in the Winslow High School.

H. H. Koplin, instructor in manual training at Kenosha, Wis., has resigned to accept a position at Houghton, Mich.

G. L. Avery and Carl C. Block have been appointed members of the committee on general vocational education for the Association of Commerce of Peoria, Ill.

C. V. Williams, of the Nebraska School of Agriculture, has been named federal vocational agent for the west central states. He will make his headquarters at Kansas City.

Arthur L. Williston, of Wentworth Institute, Boston, has been appointed New England educational director for the training of drafted men in industrial and mechanical lines. Mr. Williston will have charge of the work at Tufts College, Brown University, University of Maine, New Hampshire University, Rhode Island University, and Worcester Polytechnic Institute.

Miss Sylvia Richardson, of Escanaba, Mich., has been appointed county home demonstrator for the United States Department of Agriculture.

E. P. Westmoreland, instructor in manual training at Parkersburg, W. Va., has been given a leave of absence to enter Y. M. C. A. work in a South Carolina camp.

Mr. W. W. White has been elected head of the manual arts department at East Waterloo, Ia., for the next year.

#### THE WAR AND THE SCHOOLS.

The high school manual training shop at Iowa City, Ia., has completed several Red Cross packing boxes and has shipped a supply of checker and crokinole boards to the cantonments. The grade pupils have made knitting needles and war kits.

The New York Board of Education has set aside Public School No. 20, at Port Richmond, Staten Island, as a special school for ship yard workers. The school is used two evenings each week by twenty groups of iron and wood workers and more than 500 men are enrolled.

Allentown, Pa. Classes in practical Red Cross work have been organized for boys in the state.

War training classes now in operation in Ohio are to be continued during the summer under the direction of the state board of education. There will also be special classes in war cookery, repair work on worn garments, canning and preserving of foods. A total of thirteen cities have been granted aid thru the federal and state vocational funds.

Erie, Pa. A sixty-day course in intensive vocational education has been undertaken by 150 soldiers from a number of army cantonments. Eight hours will be given to study and two to drill.

Hazleton, Pa., has opened a number of vocational schools where drafted men may be trained in radio and other work to fit them for government work.

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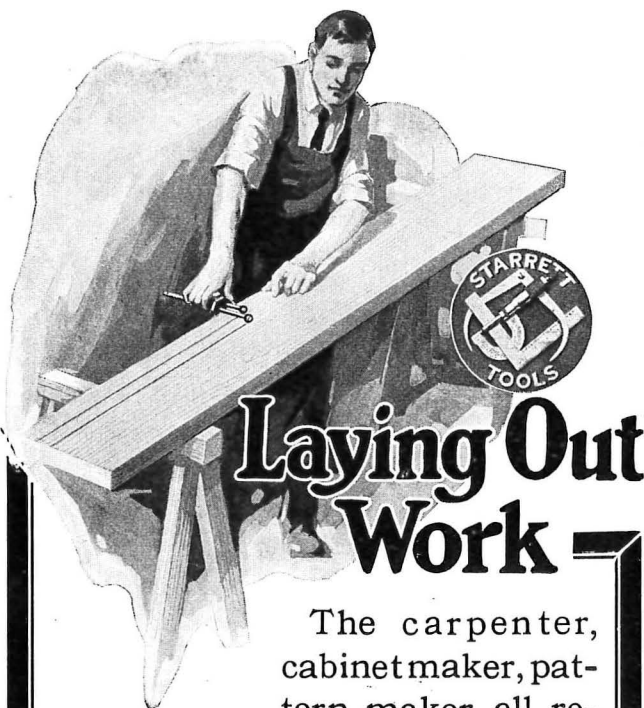


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*Springfield, Mass.* The high school and vocational school are to be turned over to the government for the training of drafted men.

*Rock Island, Ill.* The manual arts school is offering a course in radio and buzzer work for drafted men.

*Cincinnati, O.* An evening school for cooks and bakers in the army has been opened for the benefit of men in class one of the draft.

*Classes in radio and buzzer work* are to be continued in the public schools of the larger cities of Texas this summer. The government has asked for increased enrollment in these classes.

*New York City's* vocational, manual and technical schools have been turned over to the military authorities for the training of 85,000 enlisted men.

*The Girls' Vocational High School* of Minneapolis, during the past year, completed one thousand olive drab flannel shirts for the government. The school emphasizes Red Cross work in all its sewing classes and has undertaken the cutting of hospital garments, the making of sterilizing bags and the preparation of tape. Courses in telegraphy, food conservation and home dress-making have been introduced in response to war demands.

*Sheridan, Wyo.* The government has taken all of the students of the first telephone class. A second class will be organized provided sufficient men enroll.

*Four hundred* Missouri conscripts from class one have entered upon a vocational course at St. Louis. The men are divided among the Ranken School of Trades, the Washington University, Soldan High School, Junior High School, and Central High School. The men have taken a voluntary two months' training in machine shop work, blacksmithing, gas engine work, mechanics and woodworking.

*One hundred and fifty* drafted men have undertaken special training in radio-telegraphy, telephony, dynamo construction and other subjects in the Colorado College, Colorado Springs, Colo.

*The Seneca Vocational School* at Buffalo, N. Y., is training men for radio and buzzer work in the army and navy.

*Lafayette, Ind.* Five hundred national army recruits have entered Purdue University where they will be trained in automobile work, gasoline motor operation, construction of the chassis, operation of the army truck and making of repairs. Sleeping and mess quarters are in the Armory Building.

*Boys in the Marquette County, Michigan, Manual Training School* have begun the making of furniture for the convalescent houses at the base hospitals in the fields and cantonments.

*The manual training shops* of Cleveland have devoted their attention to the making of furniture for the Red Cross rest rooms connected with base hospitals at cantonments. More than fifty pieces were made in Cleveland, the designs for which were furnished by the Red Cross. Bills for material were paid by the society.

*Reed College, Portland, Ore.,* has announced that arrangements have been made for a summer school of physical education, beginning June 24 and ending September 6. The course is intended to prepare women of mature age for reconstruction aids in the hospitals for convalescent soldiers.

The college also offers a number of war courses in social problems, Red Cross Institute work, food conservation, French, personal hygiene, public speaking and physical education.

### ANNUAL MEETING OF BOSTON CLUB.

At the regular May meeting of the Boston Manual Training Club which was held in the historic quarters of the Architects' Club of Boston, the following officers were elected:

George M. Morris, president; George C. Greener, vice-president; Andrew J. Leahy, secretary; George F. Hatch, treasurer; James C. Clarke, librarian.

A number of new members were admitted to the privileges of the club. After luncheon, those who were present were privileged to listen to an exceedingly interesting discourse on the medical and industrial phases of Occupational Therapy, given by Captain Rogers, who has been appointed by the government to assist in the carrying on of such work in this section.

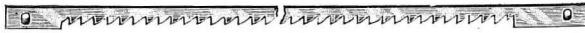
A considerable number of our members are entering the various branches of governmental service, and from present indications it would seem that many more will, before very long, have offered their services to the government in some capacity.

Mr. Edward C. Emerson, the retiring president of the club, is district supervisor of Red Cross construction work, and thru his efforts a large number of pieces of furniture have been made and are being made in various parts of New England for the use of Army and Navy men.—Francis L. Bain.

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If you are interested in the purchase of any of the items listed below, or if you want catalogs for your files, do not hesitate to check this list and mail it to the address given below:

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Teacher of.....Bids.....Wanted by.....19.....

### RECENT PUBLICATIONS.

#### War Time Occupations.

By Florence O. Bean. Paper, 42 pages; illustrated. Price, 25 cents. J. L. Hammett Company, Cambridge, Mass.

This timely little manual presents complete directions and drawings for making scrap books, checker boards, dominoes—fourteen articles in all, for the use of our soldiers and sailors. The best feature of the book is in the sections emphasizing the educational aim which should be invested upon in all productive war time work. The book is a necessary part of the desk equipment of primary supervisors and teachers.

*Vocational Rehabilitation of Disabled Soldiers and Sailors*, Document No. 166, 65th Congress, second session, Washington. D. C. The pamphlet is the result of a special research ordered by the Federal Board of Vocational Education and was conducted under the supervision of Charles H. Winslow, Assistant Director of Research. The report deals with the handicapped soldier and sailor and also with the vocational re-education of victims of industry.

*The Preparation and the Preservation of Vegetables*. By Henrietta W. Calvin and Carrie A. Lyford. Bulletin No. 47, 1917, U. S. Bureau of Education, Washington. The war and high prices of food have given a great impetus to the gardening movement and there are now hundreds of thousands of children cultivating gardens in backyards or in vacant lots. The directions in the pamphlet are intended to assist children and their parents in the preparation and preservation of vegetables.

*Plans for Vocational Education in Delaware*. Bulletin No. 6, 1917. Published by the Department of Education, Dover, Del. The pamphlet contains the plan of the state board for organizing and administering vocational education under the Smith-Hughes Law.

*Industrial Education and Dependency*. By John R. Commons, University of Wisconsin, Madison. General Series No. 705, Extension Division, University of Wisconsin. Price, fifteen cents. The pamphlet discusses the army of the unskilled, work and wages, apprenticeship schools, failure of the common schools, arts and crafts movement, union of factory and school, blind alley jobs, and future of industrial education.

*Industrial Survey of Cincinnati*. Garment making industries. Prepared by Miss Cleo Murland, National Society for Vocational Education. The present vocational study of garment making industries is the second to be undertaken by the Survey Committee of the Cincinnati Chamber of Commerce. The descriptive analysis contained in the report shows the advantages and drawbacks of the trade and sets forth the educational possibilities for development. The report should be useful not only to the people of Cincinnati but to those in other cities who are interested in solving the problems of vocational instruction for girls in the schools, and to garment manufacturers who desire to know how the schools can help them and their employees.

*Federal Aid for Vocational Agriculture in Texas, Under the Smith-Hughes Law*. By W. F. Doughty and J. D. Blackwell. Bulletin 68, 1917. Department of Education, Austin, Tex. The pamphlet outlines the conditions governing federal aid for vocational agriculture in Texas, under the provisions of the Smith-Hughes Law, in the matters of supervision and control, kinds of schools to receive federal aid, plant and equipment, maintenance, courses of study, methods of instruction, direction of project work, and qualifications of teachers, supervisors and directors of vocational agriculture.

*Governmental Provisions in the United States and Foreign Countries for Members of the Military Forces and Their Dependents*. Bulletin 28, 1917. Prepared by Capt. S. Herbert Wolfe, Q. M. U. S. A. The material contained in this report together with the report upon the care of dependents of enlisted men in Canada, has been already utilized in drafting a proposed measure for soldiers' compensation in the United States.

*Mechanical Properties of Woods Grown in the United States*. By J. A. Newlin and Thomas R. C. Wilson. Price, 10 cents. United States Department of Agriculture, Washington, D. C.

*The Substitution of Other Materials for Wood*. By Rolf Thelen. Price, 15 cents. United States Department of Agriculture, Washington, D. C.

*Report of the Organizer of Technical Education for the Province of British Columbia, 1916-1917*. Prepared by John Kyle, organizer. The pamphlet discusses the night schools, manual training and domestic science work, high school science course and junior technical classes.

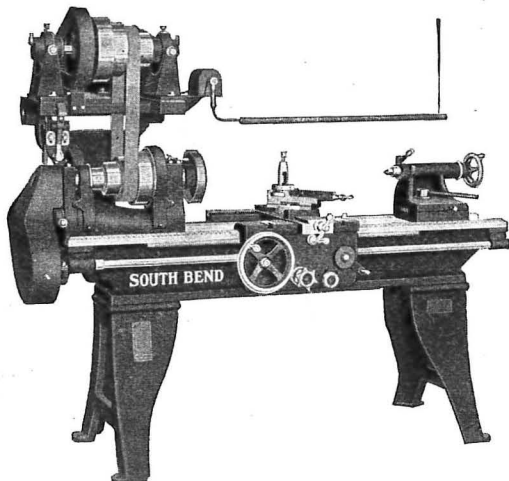


## NEWS OF THE MANUFACTURERS

## NEW SILENT LATHE DRIVE.

Considerable interest has been expressed by teachers of machine shop practice in the new type of motor drive supplied by the South Bend Lathe Company for its small and medium size lathes which are especially adapted to school work. The drive is of the silent chain type and affords a number of valuable advantages.

The attachment consists of a bracket and a tilting table on which are mounted the motor and the counter shaft cone. The counter shaft is driven directly from the motor by a high grade silent chain. The tilting table has an adjustment operated



South Bend Lathe Equipped with Silent Chain Motor Drive.

by a small lever which drops the front end of the table to allow the belt to be shifted on the cones. This can be done instantly while the lathe is in operation. The shaft runs in roller bearings immersed in oil. The bearings have a self-aligned pivoting adjustment.

A reversible switch is provided for controlling the spindle. It is instantaneous in action and operates without noise even in the hands of an inexperienced boy. Teachers will appreciate this feature because it obviates jar, noise and vibration even when a complete, quick reverse is made. The drive may be attached to any stock of South Bend Lathe.

Not the least value of the silent chain drive is the possibility of using individual motors of the standard stock type. No expensive variable speed or reversible motors are necessary.

The South Bend Lathe Company has issued complete literature describing the silent motor drive and will be glad to send it to any reader of the Magazine.

## NEW OLIVER HIGH SPEED DOUBLE SHAPER.

The Oliver Machinery Company of Grand Rapids, Mich., has just issued a circular describing its newest creation in the machinery line, the No. 483 high speed double shaper.

The shaper is simple in design, powerful in action, and durable in operation. The table is large, rigid and equipped with ring sets, drilled and tapped for guards. The spindles are large and tapering, made of high carbon crucible machinery steel, ground perfectly and guaranteed to run satisfactorily. The bearings are of bronze and are provided with oil chambers which lubricate the spindles the entire length of the bearings. All adjustments are simple and easily understood. The pulleys are of the pneumatic type, carefully balanced, and are built to fit the spindles perfectly.

The shaper runs without vibration and is built to do perfect rabbeting, grooving, fluting, routing or shaping of any kind. A quick-adjusting shaper guard is furnished with each machine and additional guards may be added as desired. The machines have found a steady sale in aeroplane and shipbuilding plants as well as pattern shops and woodworking plants.

The company also announces that it has made a number of improvements to its old machines. An added feature of the No. 15-R band re-saw and scroll saw is the new wire mesh belt guards which completely enclose the driving belts and feeding mechanisms. The No. 61 surfacer has some added improvements in the way of housing and guarding gears, sectional chip breaker and a knife grinding attachment.

Teachers of manual training in school shops who are interested in any of these improved woodworking machines should address the Oliver Machinery Company at Grand Rapids, Mich.

## BOOKS for SHOP LIBRARY

## Plain and Ornamental Forging

By Ernst Schwarzkopf, Instructor, Stuyvesant Technical High School, New York.

The author of this book has had experience as a practical smith as well as a teacher, and he treats all the subjects a good forge man should know. In a review of this volume, the Industrial-Arts Magazine said, "The book is well arranged and carefully illustrated."

x+267 pages. 5½ by 7½. Illustrated. Cloth, \$1.50 net.

## Arithmetic for Carpenters and Builders

By R. Burdette Dale, B. M. E., M. E., formerly Assistant Professor in Charge of Vocational Courses in Engineering and Correspondence Instruction, Engineering Extension, Iowa State College.

The purpose of this book is to present the subject of arithmetic as used in everyday work by the carpenter and builder in a simple and practical way. The practical man as well as the student will find much in this volume that is helpful.

ix+231 pages. 5 by 7. Illustrated. Cloth, \$1.25 net.

## Pattern-Making

By Frederick W. Turner and Daniel G. Town, Instructors in Pattern-Making, Mechanic Arts High School, Boston, Mass.

This volume is planned to outline to the younger members of this profession a general survey of the most suitable materials, special tools and fundamental processes of the trade, together with the relations of the allied departments, particularly those of the foundry.

v+114 pages. 5 by 7. Illustrated. Cloth, \$1.00 net.

## Drawing for Builders

A Problem Course in Architectural Drawing. By R. Burdette Dale, M. E.

This book is intended to serve as a basis for a problem course in elementary architectural drawing, and to be especially useful to the practical builder and to the young man who wishes to become an architect's draftsman.

v+166 pages. 8 by 10½. Illustrated. Cloth, \$1.50 net.

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# Bruce's Book Bulletin

Check the following "Bruce Books" and if you have not had the opportunity to examine them, remember we will gladly send you any book on "10 days' approval." Merely check the coupon, sign and return, and the books will be sent you without delay.

## Agricultural Woodworking

By LOUIS M. ROEHL,

Formerly Director of Farm Mechanics, Milwaukee County School of Agriculture, Wauwatosa, Wis.

The constantly increasing vocational trend of woodworking as taught in elementary and high schools, makes this book of particular value to all shop teachers in rural and suburban communities. This book includes a complete illustrated presentation of fundamental principles in woodworking and a wide variety of problems in farm mechanics suited for upper grades and high school classes. It is distinctly vocational in type and is based on successful experience in rural schools. Practical problems presented ranging from a bread board to a barn.

Cloth, 138 pages.

Price, \$1.00, net.

## Cedar Chests: How to Make Them

By RALPH F. WINDOES,

Instructor of Manual Training, Davenport, Ia.

A complete reference book on Chest Construction for students, teachers, and others interested in cabinet-making. Contains chapters on Red Cedar, the Construction of Chests, Chest Designs, the Finishing of Cedar, Artistic Metal Trimmings, the Making of Matting Boxes. Fully illustrated and handsomely bound in cloth.

Cloth, 72 pages.

Price, \$1.00, net.

## Hand-Wrought Jewelry

By H. R. SORENSEN and S. J. VAUGHN,

State Normal School, De Kalb, Ill.

The making of personal jewelry, from the simplest operations to the difficult processes of carving on complicated patterns, is described and illustrated by experienced teachers and craftsmen. Every detail which students and amateurs seek is covered and a wealth of suggestive designs is added. Simplicity, good taste, originality and appropriateness are emphasized. The book is authoritative in outlining the best methods of craft workers.

Cloth, 102 pages.

Price, \$1.00, net.

## Manual Training for Rural Schools

By LOUIS M. ROEHL,

Formerly Director of Farm Mechanics, Milwaukee County School of Agriculture, Wauwatosa, Wis.

This book has been developed as the result of teaching in country schools with a limited equipment and funds. It is planned to be used as a text by the pupils and is so clearly written and so well illustrated that any inexperienced teacher may use it. Lists of equipment, tools and complete stock bills are included. The problems are carefully graded to illustrate all of the fundamental tool processes and to provide for the pupil interesting and helpful objects which he may use on the farm and in the farm home. Fully illustrated.

Paper, 48 pages.

Price, 35 cents, net.

## Practical Forging and Art Smithing

By THOMAS F. GOOGERTY,

Instructor in Forging, Illinois Reformatory, Pontiac.

The first half of this introductory text is a practical treatment of the elements of forging in the shape of carefully graded problems and exercises. The fundamental processes and theories are carefully interwoven and the student is fully familiarized with tools and appliances of the craft.

A series of artistic projects, graded for utility and sequence in difficulty of operations, constitutes the second part. The author is a master craftsman and teacher of wide experience. Fully illustrated.

Cloth, 144 pages.

Price, \$1.00, net.

## Problems in Woodwork In Combination with Other Materials

By EDWARD F. WORST,

Supervisor of Elementary Manual Training, Chicago.

### A Book for the Upper Grades and Junior High Schools.

This book presents a complete collection of problems for the three upper grades of the elementary school or for the junior high school. It forms the basic text for the upper-grade manual training courses in the Chicago schools where it has been used during the past year.

The author has given full expression in every problem to his wonderful versatility as a master teacher, workman, and designer. He has brought to bear many years of experience as a teacher and supervisor of manual arts, as a student and worker in wood, metal, splint, cane, rush, reed, and textiles, and as a designer of useful and artistic articles for the home and school. Every problem is new and novel and has been tested for practical utility, industrial and educational value, simplicity and economy and artistic merit.

The instructor who is looking for new problems, will find the work a most refreshing source of directly usable material and inspiring suggestions.

The book contains over 200 problems in nine chapters.

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### Hand-Loom Weaving

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## BOOKLETS ON WOOD FINISHING.

The Harrison Works of E. I. Du Pont De Nemours and Company has just issued six attractive booklets which will be found of value to teachers of manual training and wood finishing. The most immediately useful pamphlet describes the Harrison oil stains, and affords examples of the use of Harrison stains on actual wood chips. Another pamphlet describes the Harrison porch chair enamel, material which is suggested for use in finishing out-door furniture.

Copies of the pamphlets will be sent to any teacher of manual training and to any reader of the Industrial-Arts Magazine who will address the E. I. Du Pont De Nemours and Company, at Wilmington Del.

## RED GUM FACTS.

"Red Gum Facts" is the title of a most valuable pamphlet just issued by the Gum Lumber Manufacturers' Association.

The pamphlet presents in popular language, detailed information concerning the physical properties and commercial uses of red gum lumber. The booklet is of more than usual interest to manual training teachers because of the teaching material which it contains. Separate articles discuss the kiln drying of gum, the making and care of doors and interior trim, the finishing of gum and the present market of gum lumber.

Every manual training teacher ought to have a copy of this pamphlet which may be had free on request to the Gum Lumber Manufacturers' Association, Memphis, Tenn.

## BUFFALO FORGE COMPANY ISSUES NEW CATALOG.

The Buffalo Forge Company of Buffalo, N. Y., has for the past forty years been manufacturing forges for a variety of uses and its products are recognized as standard thruout the entire country.

The firm has just issued a revised catalog which gives in compact form all the information which a shop teacher or foreman desires to know about the modern types of forges.

The catalog contains 112 pages devoted to forges, blowers, exhaust fans, drills, punches, shears, combination woodworking machines, and other metal products. The forges are intended for a variety of uses including jewelry making, toolmaking, riveting, boiler making, machine work, brazing, blacksmithing, garage repair, wagon making and army and navy. They are equipped for use with electric power or compressed air and may also be operated by hand levers.

Of special importance is the incorporation of the Dewey numbering system on all forges, making it easily possible to determine the designs and size demanded for a particular use in the shop.

Teachers in manual training shops who desire information about these forges should address the Buffalo Forge Company at Buffalo, N. Y.

## INDUSTRIAL MOTION PICTURES.

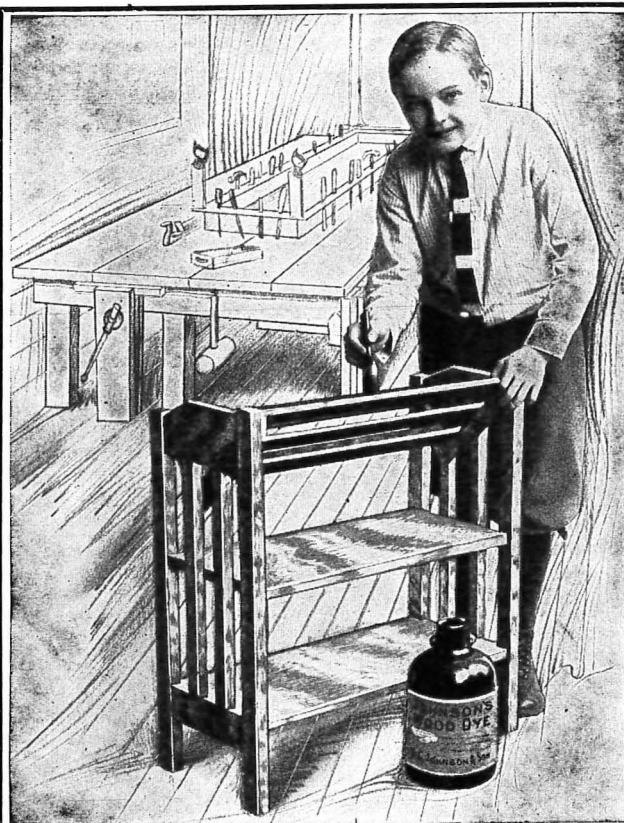
The educational department of Henry Disston & Sons has completed a revision of its List of Manufacturers Having Motion Picture Films of Educational Value and is prepared to send copies to teachers and other school authorities. The list includes more than 150 firms and business associations who have more than two hundred reels of films illustrating processes of manufacture, methods of handling and marketing products, safety and sanitary precautions, etc. Every important industrial product from matches to motor cars and from railroads to saws are included. The films are in every case to be had without charge other than shipping. Teachers are advised to obtain a copy of the list.

## A BOOKLET ON CYPRESS.

Teachers who offer instruction concerning the materials used in the manual training shop, will appreciate a pamphlet which has recently been issued by the Southern Cypress Manufacturers' Association. This pamphlet describes in detail the cypress which has become in recent years the second most important commercial lumber produced in the southern states and which holds a pre-eminent position as the most durable wood grown in the United States. The pamphlet, which is known as Cypress Pocket Library, Volume I, is an abstract of a government report on the physical properties, the supply, the early uses and the modern uses of cypress.

Copies of the booklet may be had free upon request to the association, at New Orleans, La.

The publishing house of Isaac Pitman & Sons, New York and London, has recently purchased all the existing copyrights of the scientific and technical books of Whittaker & Company of London, and will in future control the American agency for these works. The series includes important books relating to aeroplanes, submarines, wireless telegraphy and astronomy.

**Every Amateur Craftsman**

has experienced the disappointment of having a beautiful piece of furniture—one on which he has spent many hours—spoiled with improper finishing. Johnson's Wood Dye and Prepared Wax are especially adapted for furniture work—they are being used in many of the finest furniture factories in the country. The most inexperienced can use Johnson's Wood Dye and Prepared Wax successfully.

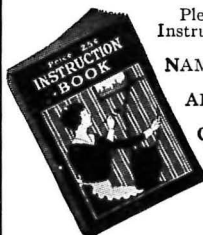
**Johnson's Wood Dye**

is the best stain to use for coloring the wood. It goes on easily, without a lap or a streak—penetrates the wood without raising the grain—is made in 14 standard shades. Johnson's Wood Dye is unequalled for staining reed and wicker baskets.

**Johnson's Prepared Wax**

is the proper finish to use over the Dye. It imparts a hard, velvety finish of great beauty and durability. It is impervious to water, dust, scratches, finger prints, etc. The finish obtained is sanitary, durable and beautiful.

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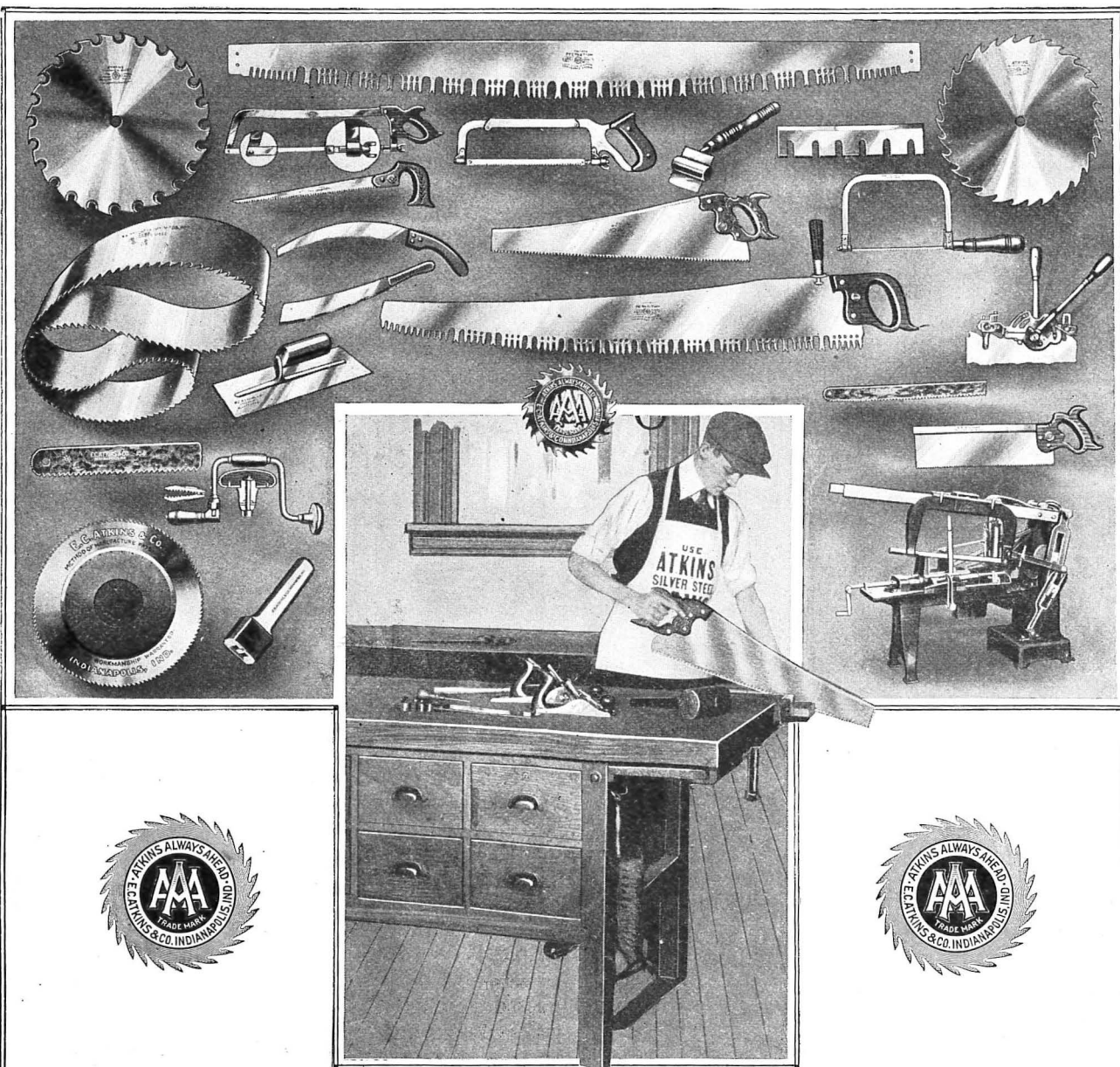
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